Gas Journal

MARCH 18, 1936

Vol. 213 88th Year No. 3800

Editorial Notes

Rural Development

Up to the year 1911 the area of the Northampton Gaslight Company was limited to four miles from the Shire Hall. The area of supply of the Company is now approximately 200 square miles, though many villages in this area are not yet linked up to the Company's mains. An account of this gradual development which, held up by the War, really commenced in 1924, constitutes the major part of the Presidential Address which Colonel Eunson delivered last Thursday to the Midland Association of Gas Engineers and Managers, and it is a very interesting account indeed. His views on amalgamation are set out clearly. The main undertaking in a district should absorb the smaller ones, and the capital should be raised in the district, thereby maintaining a local interest. This accomplished, then the districts might well be formed into groups. This plan, he suggests, is better than a financial company holding a number of small works perhaps hundreds of miles apart. The fact remains, however, that until the advent of the holding companies progress of physical amalgamation, with comparatively few exceptions, proceeded at far too leisurely a pace to cope with changing economic and competitive conditions. Another fact is that there are now fifteen holding companies, the majority working on a large scale.

The Northampton Company now supplies 32 villages, and, as stated, there are many more to be linked up. And it is significant of the thoroughness with which this rural development has been undertaken, and also of the type of service offered, that at June 30, 1935, the percentage of houses supplied in these villages was 99·4 and the consumption per consumer round about 21,000 cu.ft. per annum. The latest acquisition by the Company is the undertaking of the Newport Pagnell Gas Company—a new district regarding which the intention is to extend it and ultimately to join it up to Northampton. As each of these acquisitions and extensions has been effected, so the conditions of supply have been improved enormously, thanks to the resources of the main undertaking. Colonel Eunson mentions that examination of some of the houses previously supplied by the small companies revealed an "appalling state of affairs." He refers to the inadequacy of the carcassing, which necessitated re-piping of the houses to afford a proper gas supply. This is a story which we have unfortunately heard before when a survey is made of the distribution systems of small undertakings, and it is no use planning sales campaigns unless there is the foundation of an ample supply.

In these columns a week or two ago we emphasized that however well an appliance may have been designed and manufactured, and whatever care is taken to ensure that it is as far as possible foolproof and has a performance sufficiently flexible to suit varying conditions, it will never be fully satisfactory unless its installation is correct. In practically all cases where there is complaint by the consumer the fault lies not in the appliance itself, but in wrong installation. Again, there are all too many instances of first-class appliances of first-class appearance connected in a technically adequate but exceedingly ugly manner with over-conspicuous supply pipes and flue pipes. In the matter of appearance the manufacturers have set gas undertakings an example which it is their responsibility to follow. It is in view of this that we are in complete agreement with Colonel Eunson when he says that one of the most pressing needs at the present time is for competent fitters, and that the only way to get these is through education. Though much has been done in this direction in recent years, much more remains to be done to get a better class of fitter, especially in the country districts, and the steps being taken by the Northampton Company in the training of fitters are bound to be beneficial to the good name of gas in the country areas which have been taken over. Practical encouragement is offered to the keen man, and an active interest taken in his progress in the educational courses which have been arranged.

Bearing in mind the title of his Company, it is not surprising that Colonel Eunson pays a great deal of attention to street lighting, and, almost as a corollary, with such excellent results. Since its formation, the Company has had the whole of the street lighting in Northampton; and, as recently announced in the "Journal," the contract has recently been renewed for a further ten years. At the present time the Company has the lighting of eighteen villages within the area of supply.

Quicker Action Needed

On the day following the Midland Association Meeting Mr. A. L. Holton delivered his Address as President of the Manchester District Association of Gas Engineers, and, as was to be anticipated, it proved to be a vigorous and thought-provoking one. At the start he maintains that progress in our Industry is retarded because of failure to meet quickly the ever-widening range of keen competition and the never-ending changes in social habits and industrial life. He demands greater courage and more enterprise. He points to the pressing need for co-ordination between gas undertakings and asks why District Gas Boards should not come into existence. In common with Colonel Eunson, he believes that in this work of co-ordination holding companies start at the wrong end. He leaves no one in doubt as to what he thinks of the potentialities of holding companies, as compared with other methods of co-ordination, to increase the efficiency of gas service and widen its scope.

It is interesting, however, that gas executives are now voicing their opinions openly and unmistakably on the possible effects of holding companies on the progress of gas in this country. We are not going to enter again the controversial lists on this question, but we think that —with the exception of the British Gas Light Company— holding companies have not yet had sufficient time to prove a great deal either way; and in any event the conditions which exist in regard to the small undertaking without the financial and technical resources to cope with modern competition cannot continue indefinitely. It is difficult, too, for us to see how holding companies can hope for continued financial gain unless there is continued progress by the undertakings they control. Mr. Holton, however, suggests that, if holding companies are to assist the Gas Industry, then they would serve a better purpose if they formed vertical combines whereby control is exercised from the raw materials to the finished products, rather than horizontal combines for the purchase of gas undertakings.

The Coal Problem

Following upon this suggestion, Mr. Holton remarks: "To have an assured supply of clean coal at reasonable prices would be of inestimable value, and if the formation of coal selling schemes means that free competition is to be abolished, then it may be essential for the Gas Industry to acquire control of its raw material." This is a pretty thought, but it appears to be a long way from practical likelihood. In our review of the coal situation in the "Journal" for Dec. 25 last we pointed with foreboding to the working of central coal selling schemes. It is likely that the central scheme in the Lancashire and Cheshire district will be followed by similar schemes throughout the country. These schemes are definitely inimical to the Gas Industry and hence to the millions of its consumers. Under the ægis of Parliament it is suggested that coalowners shall now add to their existing powers of fixing output and prices that of preventing any kind of competition in the industry, and without any check on their profits or their efficiency they will be able to charge the gas undertakings of this country any price they choose for their coal. Moreover, they will be able to determine the class of coal which a particular gas undertaking may purchase.

The proposed establishment of these central selling schemes throughout the country, following on experience of the Lancashire and Cheshire scheme, is one of the most serious problems which confront our Industry to-day, and the matter was discussed by Colonel Carr at the meetings of both the Manchester Association and the Midland Association, which he attended in his capacity as President of The Institution of Gas Engineers. He pointed to the inequity of the whole arrangement, and urged a far greater measure of cohesion throughout our Industry to give full force to its legitimate claims for fair treatment. And it is a problem, too, common to all public utility undertakings, which calls for the firmest co-operation between all to further the object in view.

Making and Selling

There is an unfortunate tendency, says Mr. Holton, to assume that finality has been reached on the manufacturing side, and that the present urge is solely for better salesmanship. We thoroughly agree with him that finality has by no means been reached either in carbonizing practice or in the quality or quantity of residuals produced. Research and experimental activity must be continued, or stagnation will result. We are faced with additional costs for distribution and the expense entailed by providing a better sales and service organization, and, Mr. Holton adds somewhat sweepingly, "increased financial obligations due to the operation of holding companies." He goes on to say that two-part tariffs and other selling arrangements are being heralded as the panacea for the present difficulties, but, while they alter the incidence of certain charges and the result is a more equitable system as between one consumer and another, yet no tariff can reduce manufacturing costs. Surely, however, sales have their effect on manufacturing costs? If, by the putting into action of two-part tariffs or alternative attractive methods of charge, greater use can be made of existing plant, then the capital charges and to an extent running charges become less per unit of gas produced. In other words, the cost of manufacture is lowered. To our mind, there should be no neglect of the manufacturing side at the expense of the sales side, but at the moment the sales side suffers by comparison.

Increased costs of distribution can only be offset by increased consumption per consumer, and at the Manchester meeting Colonel Carr showed to what an extent the optional two-part tariff introduced by the Stretford and District Gas Board in October, 1934, has helped in this direction. To date, 16% of the ordinary consumers have transferred to the two-part system, and approximately 22% of the prepayment consumers. The winter of 1934-35 following the introduction of the two-part tariff proved to be extraordinarily mild; nevertheless, those who had transferred to the tariff showed in general an increase over the corresponding previous periods, and there was a considerable increase in the number of appliances either sold or supplied on hire to such consumers. For the current year, every consumer who has adopted the tariff shows an increase, and the sales of appliances continue to expand. As for the gas sold by the Board for industrial and commercial purposes, the increase for 1935 over 1934 was a matter of 48%—partly the result of going out for the load equipped with attractive tariffs.

The Future Executive

Taking the case of an undertaking the size of which warrants the appointment of only one executive officer, Mr. Holton gives his views on the question whether the chief position demands a man with commercial or technical training. A man who has the qualifications of a leader will lead whether he is technically or commercially trained, but with such a technical Industry as the Gas

Industry essentially is, Mr. Holton believes in the technically trained chief executive officer able to speak with authority and conviction on the technical side of the industry he is administering. Had the engineer kept in touch with the times the question might not have arisen. In the not very distant past, to the engineer everything outside engineering assumed a secondary place. The principles of administration, economics, salesmanship, chemical control, cost accounts, and so on, did not receive sufficient emphasis in the early training of an engineer. Yet these principles must be understood by every successful executive head. If, says Mr. Holton, the engineer does not extend his activities beyond engineering, then he must accept the inevitable and be content to allow others to occupy the executive position. We think that in the future the superiority complex of the engineer as an engineer will not be taken very seriously.

To us, Mr. Holton's views on low-temperature carbonization are very interesting, and we hope they will be carefully studied. The carbonization of coal at low-temperatures, he maintains, should not develop as a new industry. Instead, gas-works of the future should deal with all processes of carbonization. " The demand for a solid smokeless fuel superior to the best domestic coke from high-temperature carbonization is a growing demand, and will be met by the engineer who seeks to supply what the public require, as well as what he thinks, in his wisdom, would be for their good." We have previously suggested that our Industry, as a start, might well make a critical examination of the whole position of low-temperature carbonization at the present day. It would, we think, be a fruitful investigation.

Dealing with recent technical improvements in the Manchester Gas Undertaking, to which a considerable portion of his Address is devoted, Mr. Holton sets out some useful new information concerning the working results of the Cooke-Holton tar circulating system in operation at the Partington Works. Since he described this system to the Manchester Association in 1933 the process has been in almost continuous operation and has produced without difficulty road tar to the British Standard Specification. Last year a Whessoe-Woodall-Duckham electric-detarrer was added and set to work—the first detarrer to work successfully at subnormal pressures and at temperatures up to 85° C. The whole process, says Mr. Holton, is easy to operate and gives a definite financial gain approximating to 1s. per ton of coal at current market prices. With the reduction in the tar fog content of gas should come a reduction of tarry matter in the spent oxide and general improvement of the " sludging " of the wash-oil used for benzole extraction.

Institution Membership

For a long time there has been much controversy on the question of the qualifications deemed necessary for admission to membership of The Institution of Gas Engineers. It will be recalled that at the Institution Meeting last June Dr. Harold Hartley, of Radiation Ltd., expressed the opinion that the Institution shows scant appreciation of the scientifically trained men in its service, that there is too much moonshine about professional merit, and that eminent scientific men will not consent to serve on Institution panels, and the like, on what he described as an " unequal footing." Reference to the matter was made by Colonel Carr at the Autumn Research Meeting of the Institution. He explained that the Executive Committee of the Council quite appreciates that there are many technical workers who are contributing to the work of the Institution and would be most desirable members, but owing to the exact wording of the present Constitution they are not eligible for membership. He explained also that the Committee was applying itself to the consideration of minor revisions which would allow not only technical workers in gas-works, but others engaged in the carbonizing industry, to become members.

The question was discussed in more detail by Colonel Carr at last Thursday's meeting of the Midland Association of Gas Engineers. He mentioned as one circumstance that universities other than Leeds University are conducting work in connection with fuel technology where students could take a degree which, in the opinion of the Council, might be equivalent to the Leeds degree, and that, provided the other conditions were satisfied, such graduates should be able to obtain admission to corporate membership. Colonel Carr did not enter into the details of the proposals, but he stated that the Council had decided to place them before members of the Institution at the next annual meeting. They would then call an extraordinary general meeting, for the purpose of approving them or otherwise, to coincide with the Autumn Research Meeting in November next. He emphasized that all corporate members would be afforded full time and opportunity to give expression to their views. Whatever is done will be at the desire and behest of the majority of the corporate members of the Institution. We hope that the outcome of this plan will be to ensure a far greater measure of satisfaction than exists to-day with the by-laws for admission to corporate membership of the Institution, which debar so many technical workers whose help is of the utmost importance to the progress and prosperity of our Industry.

The Small Capitalist

We have on more than one occasion referred in these pages to the subject of the small capitalist, because we realize that it is one of ever-growing importance. This coming of the small capitalist is a powerful factor, whether considered from the point of view of the community in general or of the Gas Industry in particular. So far as the public aspect is concerned, no one is likely to deny that a less uneven distribution of wealth would do more than anything else to solve some of the greatest economic problems of to-day, and the multiplication of the small capitalist assists to bring this about. While as for the Gas Industry, we are often told that it has now to seek its custom to an increasing degree among the more humble sections of the community—that is to say, where the small capitalist is to be found.

The importance of the subject to our readers having been thus demonstrated, it may prove of interest to point to some statistics produced by G. W. Daniels and H. Campion, in a Paper before the Manchester Statistical Society, which had for its main object the more exact estimation of the growth of the small capitalist to which we have just referred. It seems that a quarter-of-a-century ago—*i.e.*, in 1911—the number of persons in England and Wales possessing estates of more than £100 was estimated at not less than 2,250,000, and probably not more than 2,500,000. Two years later the number was higher, but in all likelihood it did not exceed 2,750,000 in 1913. Even with the Great War intervening, we find progress being made, for by 1924 the number was estimated to have risen to between 4,500,000 and 5,000,000, and for several years after that it continued to increase, until 1929-30, when the figure may have almost reached 6,000,000. In each year mentioned, it is calculated that more than two-thirds of the estates amounted to less than £1,000. With the world depression, no doubt progress was slowed down, but the record up to that time is an eminently gratifying one.

A number of things contributed to it. As the *Financial Times* points out, the accumulation of capital

naturally has been accentuated by the growth of facilities for saving, while at the same time the margin available for saving generally speaking has been greater. The latter is perhaps the more important element, for without it facilities for saving could not meet with a full reward. But beyond these basic factors there are points of importance to be noted, and that is where the matter touches our Industry, which, as has already been remarked, caters to an ever-increasing extent for the classes among which the small capitalist is to be found. Every person in possession of even £100 of capital is, from that fact alone, a more responsible member of the community, and a more interested consumer of gas, than one who has no capital at all. He watches more keenly the progress of public affairs and the trend of private business.

We would have the Gas Industry resolve to lose no opportunity of attracting, and holding, the attention of the small capitalists. To a large extent, of course, they already have their eyes fixed upon our Industry, for many thousands of them owe their very rise to the ranks of the capitalists to the beneficent co-partnership schemes that have been put into operation by so large a number of gas companies. New profit-sharing proposals have not been so much in evidence of recent years as might have been wished, but at any rate those with the experience of years to support them continue to do good work. The profit-sharer should be a better worker, just as the small capitalist should be a better citizen and a better consumer, and we would plead for the active assistance of the Gas Industry on behalf of both. The millionaire can be left to take care of himself. The small capitalist is a plant of tender growth, but one which will amply repay careful cultivation. The country will be all the stronger, and the Gas Industry will be all the sounder, if in the course of the next quarter-of-a-century the number of persons in England and Wales possessing estates of more than £100 should have increased to 10,000,000. Here, then, is a goal at which to aim.

Personal

Sir FRANCIS GOODENOUGH is being presented with his portrait in oils, painted by Mr. G. Hall Neale, at a dinner of the Incorporated Sales Managers' Association, to be held at the Holborn Restaurant, London, on Thursday, March 19. The portrait has been subscribed for by members of the Association as a token of their appreciation of Sir Francis who acted first as Chairman and then as President of I.S.M.A. from 1926 until 1933.

The Rt. Hon. A. V. Alexander will also be present at the dinner and has agreed to address the Association on the subject of "The New Control of Industry." Mr. Alexander was First Lord of the Admiralty during the Labour Government of 1929-31, and is now Secretary of the Parliamentary Committee of the Co-operative Congress.

* * *

His many friends in the Industry will congratulate Mr. J. WESLEY WHIMSTER upon his appointment to the Board of the Bath Gas Company after 21 years' service as Engineer and Manager.

* * *

In succession to Mr. H. KITSON, who for 36 years was Gas and Waterworks Manager to the East Dereham (Norfolk) Urban District Council, Mr. W. E. STEPHENSON has been appointed. Mr. Stephenson is at present Chief of the Gas and Water Departments at Audley under the Newcastle-under-Lyme Rural District Council. He is 33 and in 1923 held an appointment with the Yarmouth Gas Company, and in 1924 he acted for some time as Assistant to the Engineer and Manager of the Sandown Gas Company.

* * *

Mr. W. T. COLEMAN has now taken up his appointment as Sales' Superintendent to the County Borough of West Bromwich Gas Department under the direction of Mr. J. Hunter Rioch, Engineer and Manager.

* * *

Mr. C. T. PRICE, M.C., Engineer and Manager of the Hampton Court Gas Company, has been appointed General Manager to the Undertaking.

It is 25 years since Mr. Price joined the Company, having previously served with the Walton-on-Thames and Weybridge Gas Company.

* * *

Mr. THOMAS R. SAWERS has been appointed to take charge of the Distribution Department of the Perth Gas Department. Mr. Sawers for the past four years has been Technical Assistant with the Falkirk Gas Department, and on leaving there to take up his new duties was the recipient of a handsome gift as a token of esteem from the staff and employees.

Obituary

Professor J. S. Haldane.

We regret to announce the death at the age of 76 of Professor JOHN SCOTT HALDANE, the very distinguished physiologist and philosopher.

Honorary Professor and Director of the Mining Research Laboratory at Birmingham and Gas Referee to the Board of Trade, Professor Haldane had been engaged in his scientific research for half a century.

He had served on several Royal Commissions and carried out various special enquiries for the Government. His investigation of the cause of the explosion in Holborn a few years ago was typical of his activities, and it will be recalled that he subsequently delivered a Paper at the Autumn Research Meeting of The Institution of Gas Engineers in 1932 on "Gases Met With Underground."

He was born at Edinburgh, and educated there and at Jena. He was not only an LL.D. and D.Sc., but a doctor of medicine. Many great honours came to him. He was awarded the Copley medal of the Royal Society and the Royal medal, the gold medal of the Royal College of Medicine, and the Baly medal of the Royal College of Physicians.

Forthcoming Engagements

Mar.

19.—I.G.E.—Refractory Materials Joint Committee, 2.30 p.m.
19.—S.B.G.I.—Council Meeting, 2.30 p.m.
20.—GAS COMPANIES' PROTECTION ASSOCIATION.—Committee Meeting, 2.30 p.m.
21.—SCOTTISH WESTERN JUNIOR ASSOCIATION.—Meeting at Bonnybridge.
21.—WESTERN JUNIOR ASSOCIATION.—Meeting at Cheltenham. Paper by Mr. J. H. Smith.
21.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.—Meeting at Swansea and Paper by D. E. Wilkins.
24.—B.C.G.A.—Eastern District Conference at Ipswich.
24.—ILLUMINATING ENGINEERING SOCIETY.—Dinner, Trocadero Restaurant.
25.—B.C.G.A.—Manchester District Conference at Blackburn.
27.—SOUTHERN ASSOCIATION.—Annual General Meeting and Presidential Address of R. J. H. Clark.

Apr.

2.—MIDLAND JUNIOR ASSOCIATION.—Meeting. Paper by Mr. F. J. Bengough.
3.—B.C.G.A.—Annual Meeting of Gas Salesmen, Caxton Hall, S.W. 1.
3.—NORTH BRITISH ASSOCIATION.—Spring Meeting at Glasgow.
4.—MANCHESTER AND DISTRICT JUNIOR ASSOCIATION.—Annual Dinner. Paper by Mr. J. A. Speers.
4.—SCOTTISH EASTERN JUNIOR ASSOCIATION.—Meeting at Hawick.
7.—N.G.C.—Central Executive Board Meeting, 2.30 p.m.
18.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting.
20.—WALES AND MONMOUTHSHIRE JUNIOR ASSOCIATION.—Annual General Meeting at Caldicot.
25.—WESTERN JUNIOR ASSOCIATION.—Meeting at Plymouth. Presidential Address of Mr. J. H. Dyde.

May.

1.—LONDON AND SOUTHERN JUNIOR ASSOCIATION.—Annual Business Meeting.
6-7.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring Meeting at Lincoln.
7.—MIDLAND JUNIOR ASSOCIATION.—Annual General Meeting. Address by Mr. E. W. Smith.

1856-1936

Eighty Years at 11, Bolt Court

By A. H.

This month the "GAS JOURNAL" has been published at No. 11, Bolt Court for the long period of eighty years, and the recognition of this fact brought with it a desire to browse upon the contents of the first annual volume issued from this address—namely, that for the year 1856. It was thought that those of our readers who may not have a complete file of the "JOURNAL" on their bookshelves might be interested in some of the notes that have resulted from this leisurely glimpse into the past.

(*Concluded from p. 675 of last week's* "JOURNAL.")

A Suggested Institution for Gas Engineers.

The year 1856 was an eventful one in many ways, and it is fortunate that the history of the time is preserved in these early issues of the "JOURNAL." It was in the "Correspondence" columns that Mr. Laurence Gomme, of Portsmouth, pointed to "the desirableness of the establishment of an institution," though he had not in mind a technical organization such as has now been built up to the great advantage of the Industry, but one that "shall provide for the wants of those members of the profession who may, by the capricious turn of Fortune's wheel, find themselves in circumstances to require assistance in their declining years." This, at any rate, was to be the main consideration, though the scheme suggested was based on a sort of Gas Club, as will be seen from the following summary:

"A Society of Gas Engineers (incorporated by Act of Parliament) should be formed in London, to which it would be deemed an honour to become a member, and to which access only should be had by merit or talent of the applicant. The advantages of such a Society should embrace reading-rooms, containing books of the most scientific, philosophic, and chemical researches, lectures on similar subjects, and conversations to the advantage of employer and employed. It should also be a resort for gentlemen of the profession to confer and compare notes, on certain grounds of information, which local circumstances may command, with other similar advantages. This Society should conduct within its walls an office similar to life assurances, where any member could, by payment of an annual sum, ensure, on arriving at a certain age or incapacity (from health or accident), an annuity for his maintenance, or, in the event of death, the admission of such member's widow into the almshouses erected for that purpose, and children into the college for suitable education. These benefits, of course, would be recovered by a graduated scale of charges due to the management of the Society."

Once more the "JOURNAL" came forward to assist—in the belief that "it must be preferable to found some permanent Institution than to be compelled to depend on the casual beneficence of men often hard-pressed themselves to maintain their own positions in society—particularly in these days of small salaries for professional men." Further correspondence followed, which showed that the need for some kind of organization for the Industry was realized.

Purification by Oxide of Iron.

The same volume of the "JOURNAL" bore witness to an active controversy with respect to the primary honour and legal right of using oxide of iron in the purification of gas. Long before this the subject had been fully discussed in our pages, when the conclusions arrived at assigned to Mr. Croll the merit of first employing oxide of iron, while to Messrs. F. J. Evans and Laming was awarded the discovery of the process of revivification, "which alone gave practical value to the invention of Mr. Croll." Though nothing had in the meantime transpired which sensibly affected the conclusions then arrived at, it was admitted that this simple view of the case had proved by no means satisfactory to all parties, and the facts were therefore again outlined—with an intimation that the Editor would be "happy to afford space for a temperate exhibition of both sides of the matter." Mr. Croll, in his patent, claimed the use of various oxides, including oxide of iron, but only in a dry lime purifier, and after the removal of the ammonia.

This limitation "did not escape the legal acumen of Mr. Laming, who thereupon took out his patent for the use of 'oxide of iron, manganese, and zinc, mixed with chloride of calcium,' or some similar agent, by which the gas could be freed at once from its ammonia and sulphuretted hydrogen, without requiring a succession of vessels." The mixture was tried at the Westminster Station of the Chartered Gas Company, and found to answer. Reference was next made to the patent of Mr. F. C. Hills, but in terms which did not satisfy Mr. Hills, who accordingly took advantage of the offer to put forward a "temperate exhibition" of his side of the matter.

This was done in a letter appearing in the following issue of the "JOURNAL," in which Mr. Hills directed attention "to the advantage of the whole system as now completed in my last patent, in which I show how to renovate and revivify the oxide of iron in the purifier at the same time that it is purifying the gas, so that the purifying and renovating processes are going on simultaneously; and which are effected by merely drawing or forcing into the gas to be purified 2 to 3% of air, the oxygen of which will renovate the iron, and the inert nitrogen will not injure the gas. By this addition to my former patents a most complete and perfect system of purification is obtained."

Mr. Flintoff.

A gentleman who added much to the liveliness of the gas situation round about that time was Mr. Flintoff—referred to in the volume of the "JOURNAL" for 1856 (between quotation marks) as "the eminent gas reformer, G. Flintoff, Esq." This "reformer" lectured at Bristol "on the science of gas lighting, with a view of showing to the public of Bristol how they were imposed upon by inferior gas and fraudulent meters." The report of the *Bristol Gazette* reproduced in the "JOURNAL" stated that, "having vehemently inveighed against the monopolist companies at present existing," the lecturer replied to a question by Mr. Brice regarding an air pump which was reported to be in constant use by the Bristol Gas Company. Mr. Flintoff explained that "such an instrument might be necessary sometimes for the manufacture of gas, but that, as Mr. Brice had hinted, it might be applied to a very different purpose, and in the course of a single night could play 'Old Harry' with all the meters of the city."

Subsequently Mr. Edey, of Bath, dwelt upon the efforts which he himself had made to put an end to the gas monopoly existing in Bath, and appealed to the meeting

" not to let him, after he had gone to the expense of bringing Mr. Flintoff to lecture in Bristol, find himself £10 or £12 out of pocket by the speculation, but to come themselves and bring all their friends with them on the following night," when the lecture was to be resumed in Bath. In spite, however, of this appeal, the audience proved to be " very much out of proportion to the importance attributed to the subject of the lecture by Mr. Flintoff and his supporters."

A Risk of Libel.

Meanwhile, correspondence upon the subject of the use of oxide of iron for the purification of gas continued, and tended towards increased breeziness. Mr. Richard Laming addressed a two-column epistle to the " JOURNAL," in the course of which he said that, if readers would refer back a couple of months they would see, from a letter by Mr. Hills, that this gentleman " had then a forlorn hope of persuading gas engineers that a ten-year-old patent of his, for purifying gas by persulphate of iron, embraced the purification of gas by hydrated peroxide of iron—his sole argument being that the latter was an ingredient of the former compound. It is a popular belief that a bad patent is better than no patent at all, but probably Mr. Hills has reflected that, to be at all useful, there must be a limit to the badness, and so has become sensible of his want of a new patent by which to buoy-up his sinking expectations."

Referring to this letter, the Editor felt himself constrained to pen the following comment: " Had Mr. Laming's previous epistle been equally free from legal consequences, it would have received the same treatment as the present "—*i.e.*, publication—" though we by no means admit the preposterous doctrine he attempts to establish—that the Editor of a public journal is bound, at the caprice of any correspondent, to accept an amount of responsibility, and incur the risks of an action for libel, which no respectable attorney has courage enough to encounter. Our reputation for firmness in a good cause, even when under the most trying circumstances, is too well established to require elucidation now; but we ever eschewed all pretensions to a senseless editorial Quixotism of the above kind." As a declaration of policy, this could not well have been bettered by any succeeding Editor.

The subject of libel again cropped up in another issue. Even as long ago as 1856, it appears, the " JOURNAL " was criticized by a contemporary, for there is reproduced, " from the last number of the *Gas and Water Times*, the following graceful and unsought-for expression of its regret at having been betrayed, in defence of interests which it conceived to have been unfairly treated by us, into accusations against ourselves, which upon calm reflection it has found to be unjustifiable: ' The long-pending proceedings in the Court of Queen's Bench by the Editor of the " JOURNAL OF GAS LIGHTING " against the printer of this periodical, for libel contained in an article published on July 2, 1855, have been recently brought to our attention by a mutual friend. We have carefully perused the article complained of, and we are ready, upon calm reflection, to admit that the terms used are in several respects unjustifiable; and we regret that, under any circumstances, we should have fallen into such an intemperate expression of opinion as to the mode in which the " JOURNAL OF GAS LIGHTING " was conducted, or of anything derogatory to the personal or professional character of the Editor.' "

Portable Gas.

Strangely enough, an event which has caused a stir in Gas Industry circles in the past twelve months had a forerunner just 80 years ago—the introduction of " bottled gas." The British Portable Gas Company's prospectus was issued, " under respectable patronage," for the purpose of introducing a new apparatus for manufacturing gas from a resinous oil. Figures of cost included led the Editor to express the view that " the system can never come into competition with coal gas, or be successfully introduced wherever a supply can be obtained from any public establishment. The prospectus, however, is free from much of the exaggeration which usually characterizes similar projects, though we doubt its success after the experience of the Vegetable Gas Company, and several other schemes for the manufacture of gas upon a small scale in private establishments."

Awarding the Palm.

Mention may now be made of two other men, whose names will always remain closely linked with the early history of the Industry. And they occur in relation to the purification by oxide of iron dispute. Some of the editorial notes in the " JOURNAL " eighty years ago were regularly headed " Circular to Gas Companies." In one of these the Editor pointed out that Mr. Lewis Thompson " never hesitates to render full justice to any opponent. Of this quality we have a pleasing example in the compliment long ago paid to Mr. Croll, as ' the original discoverer ' of the invaluable process of purifying gas by means of the oxides of iron. It now appears that Mr. Thompson was quite right in awarding to Mr. Croll this title, as it can be proved that Mr. Croll not only patented, but for ' more than fifteen months ' actually used, the oxide of iron ' mixed with breeze,' for the purification of coal gas."

The Editor then proceeded, in the following words, to make mention of the second of these two names: " Curiously enough, too, it has lately been shown, from the experiments of Mr. Alfred King at Liverpool, that the oxide of iron, when surcharged with sulphur, by repeated use may, on being burnt at a red heat, so as to expel the whole of this sulphur, be again employed with undiminished effect in the purification of gas, exactly as described in Mr. Croll's specification of 1840. This is a circumstance well worthy the attention of those gas companies who, from any cause, may be compelled to discontinue the use of lime, as it promises to render the employment of the oxide of iron even less expensive than lime." It may be added that Mr. Alfred King, who was at that time Engineer to the Liverpool United Gas Light Company, was not a relative of the then Publisher of the " JOURNAL."

Gas and Book Bindings.

Here is another very old acquaintance; one whom it is difficult indeed to shake off. Some years before 1856 Dr. Faraday had stated his belief that the binding of the books in the library of the Royal Institution was materially affected by the impurity of the gas there consumed. Referring to this accusation, a correspondent contributed to the volume of the " JOURNAL " for that year a translation of a passage from an anonymous book published in French, at Lausanne, in 1770. In this the author, dealing with the evil effects of coal smoke, said: " Libraries especially suffer from the ravages of the smoke. The most carefully executed bindings, preserved with the greatest care, and the most brilliant, rapidly assume the appearance of the books which in Paris have been exposed for two or three years, on the Quai de la Ferraille, to all the inclemencies of the atmosphere. It thence happens that students who are fond of fine bindings are obliged to shut up their books in airtight cases, and even then they are compelled to clean them from time to time."

The " Box " Nuisance.

A passage of words at the meeting of the Chartered Gas Company afforded the Editor of the " JOURNAL " an opportunity which proved irresistible to play upon the name of the first speaker. This is from the report of the meeting: Mr. John Box: There are more " Boxes " in the world than one. The Chairman (with melancholy acquiescence): I have found that out, Sir.

And thus (in part) commented the Editor: " ' More Boxes than one! ' Everybody knows too well that there are more Boxes than one in this world, though, according to the ordinary dispensations of Providence, one would seem to be fully enough for a small planet like ours. One sun, one moon, one Box. There is an old saying that troubles never come singly, and it would appear to be the same with regard to ' Boxes.' The Siamese twins were not more closely united. A certain philosopher was once very much puzzled to find out a use in the economy of Nature for the common bed-bug. Now, we are almost in a similar fix with regard to these ' Boxes.' Not that for one moment we question the general proposition that everything is useful; our difficulty is merely to discover the peculiar purpose which they serve in the social system. Empty vessels make the most sound, and, judging by the past, we very much doubt the propriety of permitting these empty Boxes to usurp, as they do, the whole time of the various gas meetings at which they may happen to be present." How the Gas Company Chairmen of those days would envy those who to-day preside over the calm and satisfied gatherings of shareholders.

A Meter Slip.

However good the past may have been, there are many things which are better done to-day than they were eighty years ago, when the following found a place in the " JOURNAL:" " A system which cannot be too strongly repudiated has latterly been adopted by some meter manufacturers, of employing persons of unenviable notoriety, and whose impudence is their principal qualification, to deliver public lectures in praise of their employers' wares, and to decry those of other manufacturers. It is much to

be regretted that any respectable person should, even inadvertently, pursue so disreputable a method of forcing a trade, as it must ultimately have the contrary effect, by inducing gas companies to combine in self-defence, and cease to deal with everyone who resorts to such a system, either directly or indirectly."

The Public Lighting Wedge.

The sort of internecine competition of those days from which both gas company shareholders and consumers suffered—that is to say, the supply of gas being undertaken by two or more companies over the same area—seemed usually to begin over the public lighting, which was used as a wedge by newcomers to force their way into a district. For instance, it was conceived that "JOURNAL" readers would "perceive with regret that a paltry misunderstanding, the origin of which may be traced to the recriminations consequent upon the accidental mutual tapping of each other's mains by careless workmen, threatens to involve the Imperial and the London Companies in an expensive and suicidal contest, by which the interests of both bodies cannot fail to be prejudiced, without any prospect of compensating benefit. The London Company, driven to desperation by the pressure brought upon it to compel its withdrawal from a portion of the extensive parish of St. Pancras, has undertaken to carry its mains over the rest of the parish, and to supply the public lights at 1s. 6d. per lamp less than the price tendered by the Imperial Company upon a three years' contract."

At just about the same time similar tactics were being employed at Cork, which city had been satisfactorily lighted for about thirty years by the United General Gas Company of London, and at a considerably lower price than was being paid in many towns in England where there was a much cheaper supply of coal. Indeed, no complaint arose "until it was suggested to be derogatory to their character as independent Irishmen to be dependent on 'foreigners' for their illumination. The spark, once kindled, was soon fanned into flame; and let the Company's gas burn ever so brightly, and let it be ever so cheap, the light was dimmed by an English shade, and the price was magnified when the money was seen through the national lens paid into English pockets. It was not long, therefore, before parties were found eager to remove the stigma on the city of Cork of being 'dependent on foreign aid' for its light." Here, again, the plans having been arranged, a Gas Consumers' Company made a tender to the Town Council for lighting the public lamps on the termination of the existing contract with the United General Gas Company. After the tenders of the two Companies had been made public, there was a meeting of the gas consumers of Cork to pledge themselves to support the new Company.

Anomalies of Scientific Evidence.

"The fate of the notorious Palmer"—the reference must have been to a poisoner who remains notorious up to the present day—being no longer in question, the Editor of the "JOURNAL" took occasion to publish some very frank views from "mere journalists," who were permitted "to usurp the function of both judge and jury," and scientific witnesses. With regard to the latter, it was said that the nature of the evidence offered at the trial of Palmer had created much public dissatisfaction, and that was particularly so with reference to what was called the scientific evidence. "The learned combatants hire themselves out, like the *lansquenets* of the Middle Ages, to fight on either side, regretting only that they cannot be paid for fighting on both. Whether for plaintiff or defendant, no lack of zeal is ever found to prevail on such occasions. The arguments are as circuitously round as the contradictions are deliberately flat, and it commonly happens that the bewildered jurors make ends meet by disbelieving both sides. Thus a zero of information is gathered."

Oxide Purification in the Courts.

With a reference or two more to the oxide purification dispute, this review of some of the more interesting contents of the volume of the "JOURNAL" for 1856 must be brought to a close. As might have been expected, the claims of patent rights in the use of oxide of iron for the purification of gas eventually found their way into the Courts, and after the hearing it was stated in the "JOURNAL" that the facts brought forward in evidence most singularly confirmed the conclusions that had been arrived at and published in our pages more than three years previously—and which have been recorded in an earlier paragraph of this review.

Reference to the evidence showed that "so far back as the year 1840, Mr. Croll used the hydrated oxide of iron for the purification of a large portion of the gas manufactured at the Brick Lane Station of the Chartered Gas Company, and," the Editor said, "we can now understand how it happened that Mr. Croll did not discover the revivifying process, as he appears to have carried the spent material to the upper part of the retort-beds, to be reconverted in a situation where the absence of light necessarily prevented him from observing the real nature of the action which ensued. Otherwise, as this is directly the reverse of that produced by heat, it could scarcely have failed to arrest his attention. Thus, the heat acting at the lowest part of the black mass of sulphuret of iron, ought to have made this red before the upper part; but the actual result, on the contrary, is that the upper part becomes red first, because this is the portion most exposed to the air, although, in Mr. Croll's case, the least exposed to the fire. We see, therefore, that had the attempt to reconvert the oxide by fire been made in open daylight, it would most likely have come within the observation of the first inventor that simple exposure to air alone was the only requisite. As matters now stand, the entire merit of revivification rests with Mr. Evans."

To come now to the legal action. Several gas companies up and down the country were using oxide of iron in various forms of combination, without the most remote idea that any infringement of any patent right occurred, while others were quietly paying royalties to one or other of the two claimants. In June, 1856, the "JOURNAL" called for "a speedy decision, in accordance with the dictates of justice," and six months later the trial of the action, *Hills v. London Gas Company*, for an alleged infringement of patent right in the use of oxide of iron for the purification of gas, resulted in a non-suit, under circumstances which, said the Editor, "clearly indicate that no patent right can, or does, exist for the employment of this oxide in the manufacture of gas." In fact, "long ere the interposition of the learned Judge, the Jury had evidently heard enough to convince them that at the date of Mr. Hills' patent—1849—neither the purification of gas by any kind of oxide of iron, nor the revivification of that oxide by contact with the air, was a novelty within the reach of the Great Seal, however cunningly applied, or pertinaciously defended after its application." The hearing was in the Court of Exchequer, before the Lord Chief Baron, who expressed the view that the patent of Laming was fatal to the plaintiff's claim.

Perhaps not unnaturally, the comments of the "JOURNAL" on the matter failed to secure the approval of Mr. Hills, who promptly wrote a letter for publication in which he declared that the action was by no means settled, and that there would be a new trial. In the same issue, too, there appeared another letter, the author of which—Mr. G. H. Palmer—also disagreed with the conclusions arrived at by the "JOURNAL," which had "failed to award honour to whom honour was due." In other words, Mr. Palmer himself had a patent of which he said: "My patent, claiming the application of both the oxide of iron and revivification processes, was secured to me so far back as January, 1818, being about 22 years earlier than Mr. Croll, 29 years before Mr. Laming, 31 years before Mr. Hills, and about 32 years before Mr. Laming and Evans. . . . It must be perceived that pecuniary motives in no way induce me now to re-open the question of claims, as my patent expired in 1832, and thus became public property nearly a quarter-of-a-century before the non-suit of the plaintiff in this action."

And so the curtain is rung-down upon the volume of the "JOURNAL" for 1856, with every promise of further exciting events to be recorded in the following and succeeding volumes. Lengthy as this review has become, it is very far indeed from doing justice to even a single one of the 212 volumes of the "JOURNAL" that have been issued.

Leeds University Fuel Department

Annual Dinner

The Annual Dinner of the Fuel Department of Leeds University, held on Friday last, proved like its predecessors thoroughly enjoyable. The chair at this essentially informal gathering was taken by Professor J. W. Cobb, and the guest of the evening was Mr. A. G. Grant, a graduate of the Department and now Chemical Engineer to the Whessoe Foundry and Engineering Company, Ltd.

Proposing the health of the Department, Mr. Grant spoke of the training given in the Department which, he suggested, was calculated to develop a critical faculty essential to the proper application of knowledge; it was a training which fitted one for tackling practical problems.

News in Brief

For Demonstrations on Their Stand at the South London Exhibition Messrs. Cerebos, Ltd., and H. J. Green & Co., Ltd., used "New World" Regulo-controlled gas cookers.

A Special Orders Committee of the House of Lords, presided over by Lord Onslow, decided last week that there was no need for further enquiry into the Wandsworth and District Gas Order.

By 24 Votes to 2 Kirkcaldy Town Council has agreed to a recommendation of the Gas Committee to rent premises at 145, Commercial Street, Pathhead, for ten years as a branch showroom.

In Respect of Gas Meters the Doncaster Corporation's estimated capital requirements during the next three years are £9,000, and application is to be made to the Ministry of Health for sanction to the borrowing of that sum.

Having Experimented for Some Time with forced draught coal firing in their kitchens, the *A.G.A. Monthly* reports, three large hotels in New York have recently decided to return to the use of gas-heated cooking appliances.

The Acquisition of the Cwmbran and Pontnewydd Gas Company is one of the objects of a Special Order under the Gas Undertakings Acts, 1920 to 1934, for which the Pontypool Gas and Water Company intend applying to the Board of Trade.

Gas has been Adopted for the public lighting of the Fetcham ward by the Lighting Committee of the Leatherhead Urban Council, and a three years' agreement has accordingly been entered into with the Leatherhead Gas and Lighting Company.

Joint Gas and Electricity Showrooms are now under consideration at Doncaster, where the Gas Committee of the Corporation have endeavoured several times to obtain showrooms of their own. The proposals, however, have invariably been held up.

A Dividend has been declared by the United Kingdom Gas Corporation, Ltd., on the ordinary shares numbered 1 to 500,000 inclusive at the rate of 5% per annum, less income-tax, calculated to Dec. 31, 1935, from the due dates of payment of the instalments.

A Special Order is intended to be applied for to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, by the Tottenham and District Gas Company with the object *inter alia* of acquiring certain lands in the Urban District of Hitchin for gas-works purposes.

At the Oldham Ideal Homes Exhibition the Corporation Gas Department has a stand where they exploit the slogan "Furnish your home with gas." Appliances and furnishings for designers of new homes or people anxious to re-model their homes make a tempting display.

The Southern Association of Gas Engineers and Managers are holding their Annual General Meeting on Friday, March 27, at the Hotel Metropole, London, W.C. 2, when Mr. R. J. H. Clark will deliver his Presidential Address. The Meeting will be preceded by luncheon at 1 p.m.

An Exhibition of large-scale apparatus for use in hotels and boarding houses by the Sandown Gas and Coke Company, Ltd., in conjunction with Messrs. John Wright & Co. (Radiation Ltd.), has just concluded. A special feature of interest was the "Guesthouse" cooker, and excellent business resulted.

Under the Auspices of the Falkirk Gas Department an exhibition of cooking and heating appliances is being given at Foundry Loan, Larbert, from March 17 to 20. It was opened by ex-Provost Muirhead, Convener of the Gas Committee. Cookery demonstrations are being given daily by Miss Parkyn, M.C.A., of Messrs. R. & A. Main, Ltd., Falkirk.

An Exhibition of Gas Appliances was opened by Alderman T. H. Herron, Chairman of the Birkenhead Gas Committee, at Birkenhead last week. He said great progress was being made with regard to gas for industrial purposes but if Birkenhead were to supply cheap gas for industrial purposes it was essential that everybody should use their fair proportion for domestic purposes. In Birkenhead alone the gas consumed last year meant that 7,000 less tons of soot were deposited into the atmosphere than would have been had coal been used instead.

A Series of Demonstrations illustrating the use of gas for cooking and washing was held last week under the auspices of the Annan Gas Company in their High Street showrooms.

A Sale by Tender of £11,000 of 4% perpetual debenture stock at a minimum price of issue of par is announced by the Great Yarmouth Gas Company. Particulars and conditions and form of tender (which latter must be received not later than April 4) may be obtained from the Secretary of the Company, 40, King Street, Great Yarmouth.

Forty-Five Gas Fitters from Stalybridge, Ashton, Hyde, Dukinfield, Mossley, and Glossop and other undertakings assembled at Stalybridge last week to hear a lecture by Dr. A. Winter, of Radiation Ltd., on the fixing of gas fires, water heaters, and ovens. The purpose of the lecture was to show the correct methods of fixing, which would result in increased efficiency and economy in gas consumption.

At the Manchester Brighter Homes Exhibition, which opened at the City Hall, Deansgate, on March 11, the Corporation Gas Department has a large stand which is designed in the form of mammoth books, the covers of which consist of living pictures of modern types of cooking, warming, hot-water appliances, and aids to home comfort and labour-saving. Representative types of apparatus are also on view. Ascot Gas Water Heaters, Ltd., are showing a representative range of modern gas water heaters.

The Chemical Engineering Congress of the World Power Conference will, as already announced in the "JOURNAL," be held in London from June 22 to 27 next. Application forms for membership have now been published, and are obtainable from the General Secretary (Mr. M. W. Burt), 56, Victoria Street, London, S.W. 1, where all communications from Great Britain should be addressed. Communications from other countries should be addressed to the International Secretary at 36, Kingsway, London, W.C. 2.

The Silver Jubilee of Liverpool's Co-Partnership Scheme was celebrated recently, and Sir Christopher Clayton, Chairman of the Liverpool Gas Company, stated that despite the fact that the price of gas had had to be increased by 0·2d., and the rules of the co-partnership scheme stipulated that the rate of bonus should be decreased by ¾% for each 0·2d. increase in the price of gas, as this was the silver jubilee, the Directors had decided that the bonus should not be reduced. The Chairman then distributed 22 long service certificates to employees with 35 years' service.

The Sales Circle of the Watford and St. Albans Gas Company was recently addressed by Mr. W. M. Paterson, Distributing Engineer, of the Brighton, Hove, and Worthing Gas Company, on "Sales Methods at Brighton." After referring to the system of builders' discounts and commissions in order to interest them in gas appliances for their estates, Mr. Paterson went on to refer to activities which fostered the goodwill of the individual consumer. Mr. Paterson concluded by referring to the good services of the publicity department they now have at Brighton. The talk provoked a lively discussion.

On Behalf of the Directors of the Slough Gas and Coke Company, Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender £20,000 of 4% perpetual debenture stock at a minimum price of £103%, yielding at that price £3 17s. 8d.%; and £37,200 of ordinary stock, ranking for a standard dividend of 5%, subject to the sliding scale, equally with the existing similar stock which for the last twelve years has received a dividend of 7% per annum. Tenders for these issues must be received not later than 11 a.m. on Tuesday, March 31.

Mr. J. Herbert Canning, O.B.E., J.P., Engineer and Manager of the Newport (Mon.) Gas Company, recently addressed the South Wales and Monmouthshire Branch of the League of Industry at Newport on "The Gas Industry." Having substantiated the claim of the Industry to be the sixth largest in the country, Mr. Canning went on to say, "In the matter of national defence the Gas Industry is capable of rendering very efficient service. During the war one undertaking alone supplied enough T.N.T. materials, manufactured lyddite, and other explosives, to fill 160 million eighteen-pounder shells." He concluded by saying that gas had before it increasing development and prosperity. He was thanked for his Address by Captain J. H. Blakesley, M.A., M.C., and Mr. Robert Burns.

The Institution of Gas Engineers

The following membership transferences and elections to studentship have been effected in accordance with the Royal Charter and By-Laws:

Transferred from Associate Membership to Membership:

BATTERSBY, WALTER HOWARTH, Gas Engineer and Manager, County Borough of Bury Gas Department.

WESTON, RONALD ARTHUR, Joint Assistant Engineer, Hull Station, British Gas Light Company, Ltd.

Elected to Studentship:

BENYON, FREDERICK ERNEST, Articled Pupil to the Engineer and Manager, County Borough of Burnley Gas Department.

WHITING, RICHARD, Pupil of the Commercial Gas Company.

National Gas Council

Meeting of the Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held at 28, Grosvenor Gardens, S.W. 1, on Tuesday, March 10—Sir DAVID MILNE-WATSON, LL.D., D.L., in the Chair.

Coal Questions.—It was reported that representatives of the Council were meeting representatives of the Central Coal Mines Scheme during this month.

Coke Oven Questions.—It was reported that a Joint Committee of members of the Council and of the National Association of Coke and By-Product Plant Owners were meeting this month to consider matters affecting the two industries.

Air Navigation Bill.—It was reported that this Government Bill, the principal object of which was to empower Local Authorities to purchase compulsorily land for the purpose of the erection of aerodromes, had been considered by the Conjoint Conference of Public Utility Associations, and it was satisfactory to be able to report that the Air Ministry had conceded unqualified exemption to public utility undertakers in respect of the compulsory purchase of land. The steps which were being taken to obtain further protection to public utility undertakings were reported.

Conjoint Conference of Public Utility Associations.—Meeting of Executive Committee on Feb. 19, 1936.

(*a*) *The Use of Silencers on Pneumatic Drills.*—The Committee considered that the efforts of the local authorities to secure a reduction of noise should be supported, and that where reasonably practicable so to do, undertakers should themselves use silencers and endeavour to secure a similar use by their contractors.

(*b*) *Hendon Town Planning Scheme.*—It was reported at the meeting of the Board in July last that the objections of the public utilities affected to the Hendon Town Planning Scheme had been withdrawn in order that a national clause might be negotiated in London which could be incorporated in all subsequent town planning schemes for the protection of public utility undertakers.

It was reported that two points had been conceded by the Ministry of Health—viz.:

(1) That where highway work was carried out under the authority of a scheme, any protection which could have been obtained under the general law should apply as if the work had been carried out under the general law and not under the scheme.

(2) That notice of all town planning schemes should be given to public utility undertakers.

New Premises at Grosvenor Place.—The arrangements which were being made to house the Associations connected with the Gas Industry in the building at No. 1, Grosvenor Place, were considered.

Date of Next Meeting.—The next meeting of the Board was fixed for Tuesday, April 7, at 2.30 p.m., and not on the second Tuesday in the month—viz., April 14.

A Deficit on the Electricity Undertaking was the subject of a lively debate at a recent meeting of the Newport (Mon.) Town Council. For the year ending March 31 there will be a deficit of £2,140, while for the year ending March, 1937, it is estimated that there will be a deficit of £2,390. The Chairman of the Finance Committee, Councillor A. Leveson, said that they had been led to expect benefits from the "grid." He thought that they had every right to expect relief of rates from the Electricity Department, but if they had not arrived at that stage then they might expect cheaper current. Statistics, however, seemed to indicate that there was no immediate prospect of this.

Women's Gas Council

Inaugural Meeting of Cardiff Branch

Eighty members had already enrolled as members of the Cardiff Branch of the Women's Gas Council before the inaugural meeting at the City Hall on March 5 had begun, and by the end of the meeting the membership was greatly increased.

The Women's Gas Council, quite a youthful organization, had been formed to provide a platform where women could express their views with regard to gas in the home, said Miss K. M. Halpin, the Organizing Secretary. It was only of recent years that the opinion of women had been recognized as a useful and constructive force. In such a connection as the use of gas it was the opinion of women—the users of gas—that mattered most, and it was the aim of the Council to provide a link between housewife and scientist to ensure co-operation.

The Council would prove invaluable to young housewives with no previous experience of housekeeping, for by attending the regular meetings of the local branch they would gather much helpful information. The phrase "scientific housekeeping" might sound a little cold and technical to women who had run homes for years and had been brought up with a knowledge of housekeeping, but to many thousands of young women housekeeping came as a new thing. Used to the business-like methods of offices where they had worked, modern housewives demanded equally business-like methods in their homes . . . scientific methods.

The part that gas played in this science was illustrated by Mrs. Eileen Murphy (Director of Home Service, British Commercial Gas Association). Mrs. Murphy drew attention to the importance of the Gas Industry in keeping British men at work. Seventy thousand British miners were employed in the interests of the Gas Industry alone.

Officers of the newly-formed Cardiff branch of the Women's Gas Council elected at the meeting included Miss A. M. Mathias (Secretary), Miss Miles, Mrs. B. J. Bell, Mrs. K. Rees, Mrs. F. Owen, and Mrs. Bartlett.

Correspondence

Common Courtesy

SIR,—Some years ago "Calisthenes" in *The Times* referred to a practice of the house of business from which he writes, by which all communications, however trivial they might appear, received a reply. This was regarded as a matter of common courtesy. It might be the application of a small boy for a position as errand boy, or the letter of their largest customer making some request. All, it was stated, received a prompt and courteous reply.

It is, perhaps, not surprising that in our Industry, in which keen competition has not been known until recently, these finer points, which are no less essential than an appreciation of monetary values, have not received so much consideration. My experience in a fair amount of honorary work in the Gas Industry and in outside public work has proved that many men make it a principle to reply to a letter promptly, or pay a subscription when it is due, while others definitely make it a practice not to reply and only to pay on the last day of grace. There are those, of course, who treat these and all other matters in a haphazard way.

The point may be illustrated in this way. It is the good fortune of organized bodies to be able to send letters by post for one halfpenny. That they are letters and of a personal nature is none the less true. Unfortunately the recipient loses, in so many cases, the personal touch of the letter because it has been duplicated, and because it has not been sealed and stamped with three halfpence. Most frequently is this the case in letters notifying the date of a meeting, and generally requesting a reply—because it has been found that without such a request a reply is most certainly not forthcoming. Even when the request is made a reply is frequently not forthcoming, or is belated. This is not business.

To the younger members in the Industry one would make the request that they regard the rule of prompt attention and courtesy as a principle, for there is no doubt that setting a rigid ideal in this particular matter will cause an extension of the spirit to other matters of vital importance, and must in the end improve the status of the staff throughout the Industry.

Yours, &c.,
HONORARY SECRETARY.

March 16, 1936.

A Gas Success at Abertillery

New Masonic Hall to be All-Gas

Gas has been chosen for the lighting, heating, and cooking for the new Masonic Hall in Abertillery, the tender of Mr. H. Maycock, Engineer and Manager to the Gas Department, being accepted in open competition with electricity, coke, and oil for central heating, the tenders being divided into three sections—(1) lighting; (2) heating; and (3) cooking.

The lighting of the main hall will be carried out with six 8-light No. 2 Bon-Marché lamps with Sugg distant control, the dining room with six Sugg Surbiton lamps, the reception room with three similar lamps, and the kitchen with three Sugg Surbiton lamps. All small rooms having a single light will be provided with switch control. The outdoor lamp will be fitted with Comet catalytic ignition. We understand that this will be the first new Masonic Hall to be all gas.

Hot water to the lavatory basins, the kitchen sink, and ante-rooms will be provided by means of an Ascot multipoint instantaneous heater. The heating will be by means of Parkinson Ubic heaters suitably arranged in the main hall and dining room.

Novelty Entertaining and Cookery Demonstrations

Food and Folk-Lore

Cookery demonstrations have always proved a popular form of appeal to the housewife and have made it possible to " put over " very effective propaganda, resulting in the greater popularity of gas cooking in the home.

A Demonstration in Progress at Brownhills.

A prominent part has been played by the Parkinson Stove Company in the development of these demonstrations. It will be remembered that a popular and novel type of educational entertainment in the form of dramatic plays was recently organized and produced by this Company in conjunction with gas undertakings, and was staged before many thousands of people with great success. In accordance with this policy of co-operation with gas undertakings, this Company has been continually on the lookout for new methods of propaganda.

This has now resulted in a novel form of entertainment. Miss Gwen L. Hughes, Diploma, Melbourne (Emily McPherson) College of Domestic Economy and Senior Demonstrator of the Parkinson Stove Company, a recognized authority on gas cooking, who has travelled extensively, presents an attractive series of dramatized cookery lectures, in which are incorporated the folk-lore, music, and costumes of Czechoslovakia and Yugoslavia. The plan of these demonstrations is to contrast with a picturesque and colourful, if primitive, background the immense advantages available for the housewife in the modern gas cooker fitted with automatic oven heat control.

Scenic effects are provided in order to create an atmosphere in keeping with the every-day life of the Czechoslovakian and Yugoslavian peasantry, and, in a typical kitchen setting, demonstrations are given of the cooking of tasty dishes of the two countries, strangely similar in all but the method of cooking to some favourite English dishes. The usual gas propaganda is very effectively embodied in these shows.

A schedule of performances during the spring period of this year has been booked with a number of important gas undertakings, and the first performance of this new venture proved a great success. This was staged in the Memorial Hall, Brownhills, with the assistance and co-operation of the Cannock Gas Company, and excellent attendances resulted. The reception given by the audience to this new form of entertainment was ample evidence of the popular attraction and novelty of its appeal to gas consumers; and the initiative and foresight of the Cannock Gas Company was amply repaid by the appreciation shown and the publicity obtained.

Naturally, considerable planning and preparation has been necessary to make this travelling show possible in different centres, week by week, and the enthusiastic co-operation of gas undertakings has been very valuable indeed. Without a doubt this new venture of the Parkinson Stove Company will prove of service in further popularizing the use of gas and the modern gas cooker.

The "Classic" Solid-Top Gas Range

Improvements in Design and Appearance

With their extensive knowledge of the chef's requirements, Messrs. Benham & Sons, Ltd., 66, Wigmore Street, W. 1, evolved the " Solid-top " gas range to take the place of coal. Since its introduction the range has been steadily improved by the incorporation of a number of improvements. For example, in 1934 the hotplate metal was " finned " on the underside, and later the powerful " Chef's " burner was introduced as an alternative to the special treble burner, which is still standard unless specially ordered. The year 1936 sees the range with improvements both in design and appearance.

The principal features of the " Classic " include: Construction in units, which added together may form stoves of any size; economy in operation, the heat being under perfect control, with thermostatic control if desired; ovens and doors heat insulated; and ovens with tiled bottoms, ensuring even temperature, and heated by external burners;

The " Chef's " burner is drip-proof, and instead of the flames acting directly on to the hotplate metal above, a cone of refractory or firebrick material is first heated. This cone becomes bright red hot, which heat, together with that of the flames, causes an intense temperature in the centre of the hotplate metal. Cooking vessels may be lowered through the hotplate in the usual manner, the burner being neither affected by overflowing liquid nor the gas mixture by the vessel lowered.

Athletic and Social

Birmingham Master Gasfitters' Association Annual Dinner.

Members of the Birmingham and District Master Gasfitters' Association and friends spent a pleasant evening at the Yenton Masonic Hall, Erdington, Birmingham, on Wednesday, March 11, on the occasion of the annual dinner. The President, Mr. Leonard Proctor, occupied the chair. The guests numbered about seventy. Following the dinner there was a dance and a whist drive.

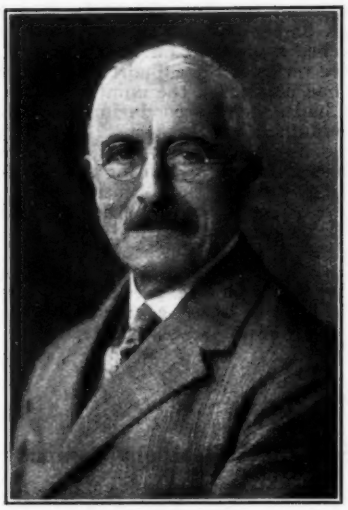
Kilmarnock Annual Reunion Dinner.

A company of over 200 was present at the 51st Annual Reunion of the employees of the Kilmarnock Corporation Gas Department held in Kilmarnock on March 6. Councillor James Bryce presided.

The toast of " Kilmarnock Gas Undertaking " was proposed by Councillor Robert Edgar, who said that Kilmarnock Gas Light Company was formed in 1822, and was taken over by the Corporation in 1872. Since that date the use of gas had steadily increased until now the present output was 375 million cu.ft. per annum. The annual consumption per consumer now amounted to 27,000 cu.ft., whereas in the year 1904 the amount was 15,000 cu.ft.

Mr. R. Fife, Engineer and Manager, said that during the past fifteen months since the inauguration of the hire-purchase scheme the Department had sold 900 cooking and heating appliances at a cost of over £7,000.

Midland Association of Gas Engineers and Managers



THE PRESIDENT.

COL. G. S. EUNSON.

Col. Eunson, who has to his credit more than fifty years' service with the Northampton Gas Light Company, took up the position of Assistant Engineer and Manager in 1889, and at his father's death in 1911 he became Engineer, thereby making up to the present time an unbroken family connection with the Company of over 90 years, his grandfather having been appointed Consulting Engineer in 1845. Last January Col. Eunson was appointed to the position of Managing Director of the Northampton Company.

The Annual General Meeting of the Midland Association of Gas Engineers and Managers was held at the Grand Hotel, Birmingham, on Thursday, March 12—Mr. A. Roberts, of Hereford, the retiring President, occupying the chair at the outset.

The Minutes of the previous General Meeting were taken as read and were confirmed and signed, after which Mr. S. J. SADLER (Solihull), who is relinquishing the Hon. Secretaryship of the Association, read apologies for absence.

Mr. ROBERTS extended a very hearty welcome to the President of The Institution of Gas Engineers (Col. W. M. Carr), and observed how pleased they were that Col. Carr, busy man that he was, had been able to come to their meeting that day. He also expressed the Association's pleasure at the presence of Mr. A. L. Holton (Chief Engineer of the Manchester Gas Department), who was the following day to be installed President of the Manchester District Association of Gas Engineers.

Mr. F. C. BRIGGS (Dudley) thereafter reported upon the year's work of the Midland Commercial Section, the membership of which was now 76. They had held four or five meetings, which had been well attended, and besides discussing different matters of interest, they had had discussions on special subjects, including "Electrical Competition," "The Replacement of Black Cookers by Enamelled Models," "Payment of Accounts and Discounts," while Mr. Oliver, of the B.C.G.A., had instituted a discussion on the Interchange of Window Displays as arranged by the B.C.G.A. Mr. W. L. Boon, of the London and Counties Coke Association, had also opened a discussion on coke problems; the question of co-operation with schools had also been dealt with. Altogether it had been a very successful year, and the more members who joined this Section the greater would be its value to the Association. It was already increasing in value every year, and they had recently appointed a Coke Sub-Committee whose business it would be to consider the possibility of forming a Midlands Coke Association which could deal with the sales of coke on a co-operative basis in the same way as the London and Counties Coke Association did. This would be of considerable advantage to the Midlands gas undertakings, and they hoped that every member of this Association would join the Commercial Section if only for this particular purpose. He then formally moved the adoption of the report.

The proposition was seconded by Mr. R. S. RAMSDEN (Leamington) and carried unanimously.

The Midland Education Committee.

Mr. BRIGGS then went on to refer to the work of the Midland District Education Committee. Their work, he stated, was going on almost automatically and very efficiently. The Committee itself had not had to do a great deal during the year, but its officers had done much to assist students. Gas Engineers did not appear to take a great deal of interest in this scheme until they had a pupil whom they wanted to take an examination. This was one of their most important Committees, and it had done much in the direction of helping students along the right road. He would like to take this opportunity, said Mr. Briggs in conclusion, of appealing to members of this Association who were on that Committee to attend its meetings. There was to be a very important discussion in the near future on the subject of greater co-operation with local technical colleges. He then moved the adoption of the Education Committee's report.

This was duly seconded by Mr. H. DAVIES (Chesterfield) and carried unanimously.

Thereafter, on the proposition of Mr. ROBERTS, seconded by Col. G. S. EUNSON (Northampton), the Annual Report and Statement of Accounts were unanimously adopted, there being no discussion thereon.

Mr. ROBERTS then proposed that Col. Eunson be appointed as the Association's representative on the Council of The Institution of Gas Engineers. It had been their practice, he said, to elect their President to represent them on that body, and he was sure they could have selected no better name than Col. Eunson's.

Mr. C. M. D. BELTON (Shrewsbury) seconded the resolution, which was unanimously agreed to.

Mr. ROBERTS also moved that the following members be appointed to represent the Association on the Midland District Education Committee:

Col. G. S. Eunson.	Mr. F. C. Briggs.
Mr. H. Davies.	Mr. W. G. S. Cranmer.

Mr. C. H. WEBB (Stourbridge) seconded the motion, and it was unanimously agreed to.

New Members Elected.

The following applicants were then elected to membership of the Association:

Mr. R. Halkett, Jnr. (Sheffield).
Mr. H. Chamberlain (Sheffield).
Mr. C. R. Ingham (Cannock).
Mr. W. R. Tildesley (Tamworth).

The New President.

Mr. ROBERTS said it was now his pleasant duty to introduce Col. Eunson to the Presidential Chair; but he really needed no introduction to members of this Association. Though not a very old member of the Midland Association, Col. Eunson was an old and active member of the Gas Industry. They had made a very happy choice in electing him as their President, and from his own experience Mr. Roberts felt sure that Col. Eunson would have a very pleasant year of office.

Col. EUNSON then took the Chair, and, in doing so, he proposed a very hearty vote of thanks to Mr. Roberts for the work he had done during the past year, not only in connection with the meetings of their Association, but also in attending many meetings in London. He was rather afraid that Mr. Roberts' health had been somewhat impaired as a result of his year of office, but he had recently taken a holiday, and they hoped he would soon be restored to perfect health.

Mr. F. C. BRIGGS, in seconding the vote of thanks, remarked that during the time Mr. Roberts had been Hon. Secretary he had demonstrated to them his great powers of

organization, and they did very well in electing him President. Mr. Roberts was one of the outstanding examples of the foundation stones of their Industry. The success of the Gas Industry, he suggested, depended upon the undertakings in the provinces, who had not the great financial resources of those in the large towns. In Mr. Roberts they had an example of a man running a provincial gas undertaking with the greatest efficiency. When the Association visited his works they saw how excellently equipped and maintained they were. As President he had added lustre to the annals of their Association.

Col. EUNSON then presented Mr. Roberts with the Past-President's medal as a mark of the work he had done for them during the past year. He hoped that this would not merely provide a mark of his occupancy of the Chair, but rather that by it he would be reminded of the gratitude of the whole of the Association for the great work he had done for them.

Mr. ROBERTS, in acknowledgment, thanked the President and Mr. Briggs for the kind remarks they had made. He wished to express at the outset his appreciation of the way the members had supported him during the past year. His thanks were specially due to Col. Eunson and Mr. Briggs for what they had said. He regarded their meeting at Hereford as very successful, and he greatly appreciated the excellent attendance. His thanks were also due to the Hon. Secretary, who, unfortunately, was retiring; everybody realized what the Hon. Secretary meant to a President, and Mr. Sadler had left no stone unturned to make his year of office a pleasant one. Mr. Roberts also spoke in appreciative terms of the support of the Technical Press. Col. Eunson had mentioned the number of meetings he had attended; he had endeavoured during his year of office to represent the Midlands to the best of his ability in London. He had attended every Council Meeting of The Institution of Gas Engineers, as well as visiting the Southern Association, the Manchester District Association, the Wales and Monmouthshire Association, and the Midland Junior Association. He had done that with one object—namely, to uphold the dignity of the office of President of their Association. In conclusion, Mr. Roberts thanked them once again for the medal and expressed the hope that Col. Eunson would have as happy a year of office as he himself had had; if so, he would have no regrets.

Presidential Address

Of Col. G. S. EUNSON, Managing-Director of the Northampton Gaslight Company

I should like first of all to offer to you my thanks for the honour you have conferred upon me in placing me in the proud position of President of this Association, and I can assure you that I fully appreciate it.

I regret that I was not in a position to join this Association until late in life, and I regret it the more because I had not the opportunity of coming in contact earlier with the Engineers in charge of Works in this District. I would like to say that I will do all in my power to maintain the high position which this Association enjoys, and carry on the excellent work of my predecessors.

My family have been connected with the Gas Industry in this district for the last eighty years. My grandfather came from Scotland to be Engineer of the Wolverhampton Gas Company, and during that time he was the first Engineer to make his own fireclay retorts in one piece and on his own Works. He was also one of the first to experiment with the vertical retort, but as this was direct-fired, it did not prove a success.

I commenced my career at a time when the gaseous firing on the regenerative principle had been introduced, and I was fortunate in having the great opportunity of following the early experiments with this system which were carried out at the Northampton Works. These first were the Siemens regenerative settings with an outside producer. These were successful, but the outside producer was not altogether satisfactory owing to the heat loss of this producer, and the process of clinkering was very fatiguing for the men.

The Klönne system was introduced in 1883 with the producer built into the bed itself, this proving a great advantage as the heat loss was thereby overcome. The drawback to this system was the high cost of the special bricks which were required for the regenerative flues. After much experimenting this was overcome by the use of ordinary bricks and a few special flue covers. This setting formed the basis of all horizontal regenerative settings up to the present time.

In 1914 we introduced at Northampton the Glover-West vertical retort installation. This consisted of four settings of eight retorts. To this we added a further installation in 1917, another in 1923, and a fourth in 1927. We now have a total of 16 settings of retorts and are capable of producing the whole of our gas on these installations.

During the re-setting and reconstruction of these installations, we have from time to time kept abreast of all improvements, and during last summer advantage was taken of the reconstruction of one of the installations to introduce a new development in one setting. For each of the lines of four retorts, each measuring 33 in. on the major axis at the top section, we substituted two retorts, each measuring 80 in. at the corresponding section. These retorts are successfully heated on the Glover-West principle, in which the producer gas rising in an up-take flue is progressively introduced to horizontal combustion chambers, so that the temperature of the retort can be suitably graded over the entire perpendicular section of the retort according to the class of coal being carbonized, the products of combustion being circulated round the tops of the retorts through three circulating chambers before passing away to the waste gas flue.

The only essential departure from standard design was the substitution of two helical worm coke extractors to each retort instead of one. The two extractors are driven from the same set of gearing as the other retorts in the installation, and they work perfectly together. The effect of this new development is fairly obvious. The increase in carbonization on an equivalent ground space is of the order of 16 to 18% and there is a reduction in the number of operations per unit of production incidental to a larger unit.

As this was only an experimental setting, the two previously existing top mouth-pieces and coal-feeding devices were fitted to the one retort. This, of course, would be in the new installation concentrated into one. This setting was put to work for two months, and the results were very satisfactory.

The size of coke produced was rather astonishing, as this was considerably larger than anything that we had had through any of our previous installations.

John West.—It may be a matter of interest to know that the late Mr. John West commenced his business career at Northampton, and a great friendship with my father began which remained for all time.

Extension of Area of Supply.

In 1911 it was realized that with the keen competition with which we were faced, we were likely to lose a proportion of our load, and to meet this an extension of area was necessary. Up to that time our area was limited to four miles from the Shire Hall in Northampton; consequently any proposed scheme of extension necessitated obtaining additional powers.

This matter was very carefully considered, and in 1912 our mains were extended to a village within our limits, as an experiment. This proved such a success that a scheme covering a large area was considered by my Directors, and a progressive policy adopted. This scheme was not decided upon without justifiable misgivings on the part of some, as risks had to be taken and a large amount of capital raised. The results, however, have proved that the Directors were justified in every way in taking these risks.

These extensions were to have commenced in 1915, but the war stopped everything, for the time being, and it was not until 1924 that a real start could be made.

There were three small Companies supplying gas within a radius of ten miles of Northampton—Towcester, Weedon, and Long Buckby—with all of which I was connected as Engineer; and the idea was to buy up these Companies when circumstances permitted, to link them to our own system, and ultimately close these Works and supply the whole of the gas from Northampton.

In 1924 the mains were extended south to Wootton, and in that year out of a total of 142 houses, 140 took gas in some form. This same year mains were extended to Kislingbury and Harpole, and an 8 in. main was put down here with the idea of extending to Flore and Weedon. In 1925 a Special Order was obtained from the Board of Trade for an extension of area to include Brixworth and Walgrave to the north, Towcester to the south, Horton to the east, and Weedon to the west. Five years was allowed for the extension of mains in these districts.

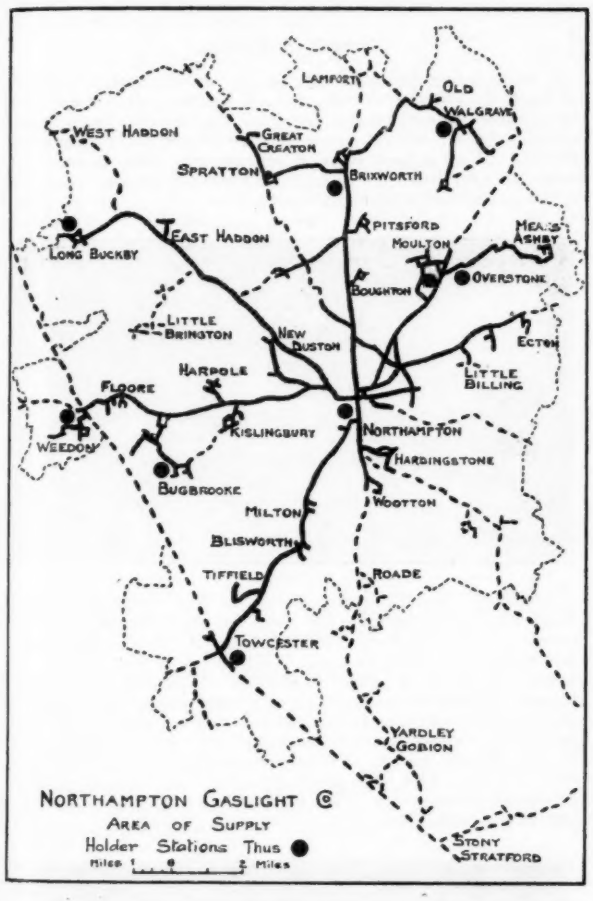
The mains to Pitsford and Brixworth were laid in 1925, and the extension to Walgrave in 1929. In 1927 an order was obtained for the purchase of Weedon Gas Company.

This was a small Company which was formed in the first instance to supply gas to the Barracks and Government Stores. It also supplied the village of Flore, one mile distant. In 1925 this Company was supplying 9¼ million cu.ft. of gas, but in 1926 the War Department changed over to electricity, with the result that the consumption fell to 6 million cu.ft.

Since we acquired this Company the consumption has steadily risen and now stands at 13 million cu.ft. This shows what can be done by expenditure of capital and service to the consumer.

In 1928 the main was extended to Weedon, taking in on the way the villages of Bugbrooke and Heyford. The Works at Weedon were then closed down for the manufacture of gas, but the holders having a capacity of 38,000 cu.ft., still remain in use. In 1928 the Brixworth main was extended to Spratton, and in 1930 to Creaton.

A further extension was also made on this main to the villages of Church and Chapel Brampton, and this will ultimately be connected with a main we are at present laying from Northampton to Long Buckby. In 1929 the main



was carried on from Moulton to Overstone and Sywell, and in 1931 to Mears Ashby. This main is now within a few hundred yards of the Wellingborough Company's mains. In 1931 a Special Order was obtained for the purchase of the Towcester Gas Company and for an extension of the area of supply in that district.

One of the conditions of the Order was that a main should be laid from Northampton (eight miles) and the Towcester Works closed down for the manufacture of gas within three years, the gasholders at these Works being used for storage purposes. The main was completed in 1934, and on the way the villages of Milton, Blisworth, Tiffield, and Hulcote were supplied with gas.

Again in 1931 a further extension was made in the northern section to the villages of Walgrave, Hannington, and Holcot; and a further extension will be carried back to Moulton, thus completing the circle on this side of the county.

In 1933 a Special Order was obtained for the purchase of the Long Buckby Gas Company. This at the present time is being worked as a separate Works, but the Order only allows this for three years, after which a main must be laid from Northampton, and gas supplied from there. This will be put down this year, and two villages on the way—Harlestone and East Haddon—will be supplied.

It is intended in the future to extend this main to West Haddon, Guilsborough, Hollowell, and Creaton, thus completing the circle on this side of the county.

Village Supply.

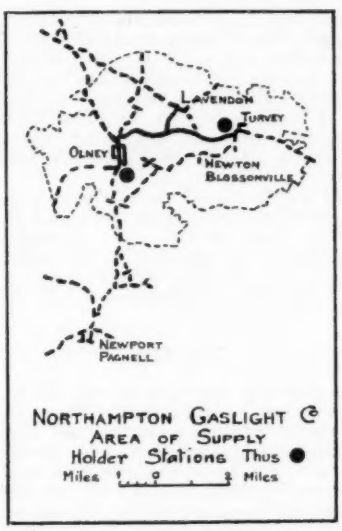
Before deciding to lay mains to a village, it is canvassed, which usually results in about 30% of definite promises. This we have found by experience is sufficient to commence with, and mains are laid of ample size to give every house a full supply.

During the time our fitters are in the village every encouragement is given to householders to take a supply, by dealing liberally with them with regard to fitter's time and discounts on fittings. This may appear over generous, but our experience shows that before we leave a village we have usually as many as 90% of the houses taking gas for cooking and other purposes. There is no doubt that generosity is the key-note of success in all these extensions.

At June 30, 1935, the percentage of houses in our 32 villages supplied was 99·4, and the consumption per consumer was from 20,000 to 21,000 cu.ft. per annum. The majority of these consumers are on the prepayment system. At the present time we supply to our villages over 100 million cu.ft. per annum.

The area of supply of the Northampton Company is now approximately 200 square miles; but there are very many villages in this area not yet linked up to the Company's mains.

The Northampton Company has acquired the whole of the shares in the Olney Gas Company. This is a Company



twelve miles distant in the County of Buckingham, and we have also bought the Turvey Gas Works in the County of Bedford. This latter is a very small Company in a district which lends itself to development.

We have also made an offer to the Newport Pagnell Gas Company which has been accepted by the Directors. This is the commencement of a new district which it is hoped may be extended and ultimately joined up to Northampton.

Mains.

The whole of these village extensions so far have been carried out with low-pressure mains, and we have no high pressure at present outside the Borough boundaries. This system, of course, necessitates district holders, which add to the capital cost; but, on the other hand, we save the cost of compressors, district governors, maintenance, and running costs of same.

District holders are installed at the most favourable points, and in this way they come into action and maintain the pressure at peak load time, with the result that at that time they are not robbing the town mains but are in a small way helping them to maintain their required pressure.

These main extensions have been carried out with cast-iron spun pipe or steel, the selection depending upon the nature of the soil in which they are laid and the market price of the material at that time.

Northamptonshire is very rich in iron. In certain districts great care must be taken that all mains are carefully covered and steel mains wrapped, to ensure that the surface of the main does not come in contact with the iron in the soil; otherwise they are eaten through in a very

few years. We have found that steel requires very careful attention in this direction when being laid.

Along all roads mains are laid as far as possible in the grass verge and only in the carriageway through villages where a grass verge or sufficiently wide footpath does not exist. There is no doubt that with reinforced concrete roads the time is coming when all mains on new estates will have to be laid in the footpath, if possible on each side of the carriageway. In a number of new estates we have laid our mains in this way and we feel confident that it will be to our advantage in the future.

Northampton and the surrounding country area is not an easy district to supply, as it is very undulating, and it is difficult to maintain a satisfactory pressure at all points, but, as previously stated, this we have overcome by the use of district holders. I might say that another difficulty we have experienced in laying mains through some of the villages in the district is the presence of old stone drains. No one seems to know what they drain or where they discharge, and there are no records kept of these by the Local or Parish Authorities. Consequently the only way we can overcome the difficulty is by making good these drains as our own work proceeds.

Since 1911 we have laid 70 miles of mains to supply villages and housing estates outside the Borough. These housing estates have sprung up in all directions, and ribbon building has developed to a great extent in this district.

While on the subject of mains, I would like to draw attention to the large amount which we have had to expend on re-laying mains in the Borough, necessitated by the reconstruction of streets.

Many of these renewals would fall due during the next five or ten years; but as most roads are now being reconstructed with reinforced concrete, it is essential that renewals should be done beforehand, as no one wishes to open up the roads within a few years of their reconstruction. This requires a large outlay at once instead of spreading it over a term of years, and this must come exceedingly hard on the smaller Companies who are faced with the same difficulties.

With regard to the Local Authorities, I would like to say that our relation with the County and Borough Surveyors has always been cordial, and although we as a Statutory Undertaking have powers in the roads, there must be a policy of give and take, and we have always found the Officers of the Local Authorities ready to meet us in these matters.

Dry Gas.

At a recent meeting information was asked for with reference to experience in drying gas. About two years ago we went carefully into this matter and considered the several systems then in operation. We finally decided to install a plant of the calcium chloride type, and at one part of the Works we installed a plant of the tower scrubber type, while on another part of the Works we installed a plant of the rotary washer type.

Both of these plants are fixed on the outlet side of the Works holders, in this way making it unnecessary to oil film the water in the holders. We have, however, filmed the district holders in order to prevent the dry gas taking up moisture when it is stored at these various points.

We do not aim at entirely drying the gas, as I fear that this might lead to trouble with our meter leathers on the district, and at present we reduce our moisture by 50%. At first we had some slight trouble with dust—principally dust from the mains—which prevented the cut-off valve of prepayment meters from closing. We have had no trouble with this lately.

Fitters.

One of the most pressing needs at the present time is for competent fitters, and the only way to get these is to educate them. Much has been done in this direction during the past few years, but much more remains to be done to get a better class of fitter, more especially in the country districts.

Mr. Ramsden, in his Presidential Address two years ago, drew attention to this, and pointed out what means his Company had adopted in this matter. We have worked on much the same lines with very good results. Our outdoor Superintendent gives lectures at the Technical College to our fitters and others who wish to attend. Our fitters are expected to attend, and the College fees are paid by the Company. On the results of the examination held at the end of the Session depends to a certain extent the position of the fitter.

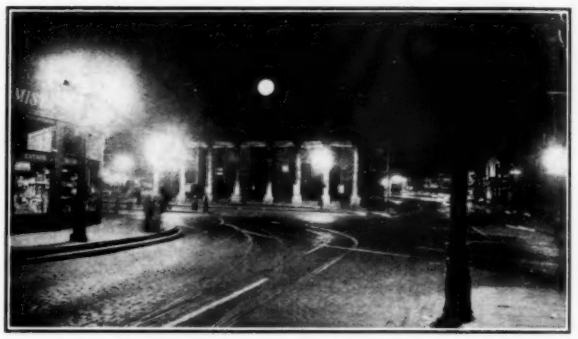
In the districts which we have taken over and where gas was already supplied, the first thing which has to be done is to send a competent fitter to go through each house and see that the pipes are of such a size as will give a full supply to all apparatus in use, and something to spare for future additions.

The result of examination in some of the houses supplied by the small Companies reveals an appalling state of affairs, and in many cases $\frac{3}{8}$ in. compo seems to be taken as the standard size of pipe for all houses. I do not want to eliminate the village plumber, and I am ready to help him as long as he will conform to some Standard Specification.

When the laying out of large housing estates was commenced in Northampton, it was found necessary for some steps to be taken to ensure that pipes of a proper size for a full supply of gas were put in, and tested for soundness before the floors were laid and the plastering completed. We decided that the most satisfactory arrangement was to pay the builder a sum per point, the number of points in a house to be fixed by agreement, providing that the work was done to our Specification and tested and passed by us before the pipes were covered up. This I know costs money, but it has been proved over and over again that it is well worth doing as it saves much in the long run and gives satisfaction to the consumer.

Street Lighting.

I am a great believer in gas for street lighting because of both its efficiency and cost. I agree with some that it is a good advertisement for gas, but unless you can get a price for it which gives a fair return it is not worth having. Unless you have a margin of profit it is impossible to introduce new lamps as they are brought out and so keep the lighting right up to date.



With the widening of streets in Northampton, islands have been introduced. On each of these islands we have erected high standards, each fitted with two 1,000 candle-power low-pressure lamps. This has proved a most successful method of street lighting. The majority of our lamps are low-pressure, with a proportion of high-pressure in the centre of the town. We find that the low-pressure lamps are most satisfactory except in a few exposed places during heavy gales, several of which we have had this last winter. The high-pressure lamps at these times have given us no trouble. The whole of the low-pressure lamps are clock controlled.

As a matter of economy a proportion of the lamps in the side streets of the town are extinguished at midnight. This caused a number of complaints of darkened streets by workpeople who were out between 6 and 7 o'clock in the morning during the winter months. To these lamps we have now added extra attachments to the clocks whereby they are re-lighted at 5.30 a.m. until daylight.

There is no doubt that with all systems of street lighting cleanliness is most essential. In some of the smaller towns at least 50% of the light is lost by dirty lanterns, and it is only by a systematic cleaning of these that the full effect

of the burner is maintained. In Northampton we have had the whole of the street lighting since the formation of the Company, and we have just renewed the contract for a further ten years. All columns, lamps, and controllers are the property of the Gas Company.

We have also at the present time the lighting of eighteen villages within our area of supply.

The Industrial Load.

I am a great believer in gas for industrial purposes; but when fixing rates there is always one question to the fore—and that is where to draw the line between household and industrial loads.

So far we have done it by a scale of rebates for large consumers; but this does not meet every case, and we are now considering new tariffs whereby both domestic and industrial consumers will, after consuming a certain amount, obtain gas at the low price of 6d. per therm.

The trade of Northampton is boots and shoes, and it is the only trade we have. This during the last few years has passed through a time of depression, but I am pleased to say that trade is looking up.

I am entirely in agreement with Mr. Roberts when he said in his Address last year that a gas unit of 4,000 B.Th.U. is necessary. Until we have something like this we shall never be able to show to our consumers a proper comparison of our prices with those of our competitors.

In the early days (1860-1870) the trade of boot and shoe making was all done in the homes of the operatives, and it was necessary to have some form of heating for the irons used in the work, and, gas being found the most convenient form of heating, it was installed in most of the small houses. When the factory system came into operation the gas load was transferred to the factory, and a large proportion of the houses discontinued the use of gas because the quarterly bill was a burden.

When I first commenced business, the penny-in-the-slot meter was becoming a business proposition, and I made up my mind, if possible, to see it introduced. I had a census of the houses taken and found that there were 10,000 not using gas but a large proportion serviced. A scheme was worked out and laid before the Directors, and it was passed. It was received by some with misgivings, and it was said that with so much money being left in the houses it was putting a premium on thieving and that the money would be stolen.

The system was a great success from the commencement, and, with regard to thieving, the loss in the first four years was less than a sovereign.

This necessitated the introduction of dry meters, for up to that time the majority of our meters were wet. We still have on the district a few wet meters, but I am pleased to say that these will soon disappear.

Cooking by Gas.

I have always taken a keen interest in cooking by gas. The first gas cooking stove was made in Northampton somewhere about 1830 by James Sharp, who was at that time collector for the Company. This was a rectangular box of tinned iron 18 in. by 18 in. by 4 ft. high, with two rows of luminous burners about 4 in. from the bottom. There was ventilation at the bottom to admit the air and an outlet pipe at the top.

We had one of these original stoves up to some 40 years ago, but it was lent to an Exhibition in London and was lost. The early cooking stoves all had luminous flames, and I may say that they were very efficient but not economical.

In 1883 it was decided to let out gas cookers on hire to consumers. The stove which we let out on simple hire was the "Metropolitan," manufactured by Messrs. H. & C. Davis & Co., now the Davis Gas Stove Company. Very few were sold or let on hire purchase, the latter never having taken on here until about ten years ago. Now we are doing much the same as other Companies.

The enamelled cooker is the established model, and much expense has had to be met in the introduction of these and the scrapping of the black cookers. We have at the present time 28,000 cookers on simple hire, including those of the slot installations. We do our own cleaning and repairs, and we have tried the experiment of having some of our old black stoves enamelled; but so far this has not proved a great success.

Holding Companies.

Much has been done lately with regard to the buying up of small undertakings by financial companies, and although I agree that much may be done in the provision of capital for extensions I think we are beginning at the wrong end. I believe that the proper method should be amalgamation in districts.

First of all, the main undertaking in a district should absorb all the smaller ones, and where possible supply gas from the main undertaking. The district would then be supervised by a competent Engineer, and much money saved. The capital can easily be raised in the district and local interest maintained—a state of things most desired. When this is accomplished, the districts might be formed into groups. I am certain that this would result in more good to the Industry than a financial company holding a number of small works some hundreds of miles apart, where conditions and prices are so different. Our great aim is the reduction in the price of gas, and this cannot be done if small companies change hands at a ridiculously high figure.

The Northampton Gas Company was formed in 1824, and at once the new form of light was eagerly adopted. At first, the charge for gas was per burner, which was only allowed to be used for an agreed number of hours. How this was arranged I cannot explain, but from an entry in an old Minute Book I find that a consumer was warned that the gas was seen to be burning in his house after the permitted time. Meters were introduced in 1830, and the price of gas was 1s. per 100 cu.ft.

The first Works were built on the present site, which is in the lower part of the town near the river. The holders (two) were in octagonal houses. A part of the original retort house was only demolished a few months ago. The Works have been rebuilt and extended from time to time, and are now thoroughly up to date, with ample room for extensions. The offices, showrooms, and fitting department, which up to 1898 had been at the works, were removed to a site in the centre of the town. These are proving too small, and further rebuilding and extensions are contemplated.

I am not attempting to describe the Works, as I hope that all our members will have an opportunity of visiting them and examining them for themselves.

I have been asked by my Chairman and Directors to extend to you a cordial invitation to hold your Spring Meeting at Northampton, and I can assure you that you will have a very hearty welcome.

Vote of Thanks.

Mr. ROBERTS said that it gave him very great pleasure to propose a hearty vote of thanks to Col. Eunson for his Presidential Address. As they knew, a Presidential Address was not subject to criticism; but he would, nevertheless, like to refer to one or two points. Col. Eunson had mentioned that he was one of a long family of Gas Engineers, while he had also made specific reference to street lighting. In Hereford they had just removed the last of the electric lamps and replaced them with high-pressure gas lighting. In conclusion, Mr. Roberts informed the members that the Spring Meeting, which the Directors of the Northampton Gaslight Company had so kindly invited them to hold in that town, had been arranged for Thursday, May 7 next.

Mr. H. DAVIES had much pleasure in seconding the vote of thanks, and expressed the members' gratification in having Col. Eunson in the Chair that day. Although he had not been a member of their Association as long as some, they all looked upon him as an old member of the Gas Industry. His Presidential Address had been extraordinarily interesting, and they would look forward to paying a visit to Northampton in May.

Col. W. M. CARR (President of The Institution of Gas Engineers) said that it was a great pleasure to him to visit the Midland Association for the first time in his capacity of President of The Institution of Gas Engineers, and it had been particularly pleasant to hear Col. Eunson's most interesting Address. As Mr. Roberts had said, it was not open to discussion; but he hoped that the President and members would forgive him if he took the liberty of referring to some of the most interesting points which had been raised.

Amalgamation and Grouping.

In the first place, he congratulated the Northampton Gaslight Company and Col. Eunson on the good work they had done in linking up the area of the county of Northampton; they had set a great example to the Industry, and he entirely agreed that they would have heard nothing of Holding Companies if all the larger gas undertakings had had the wide ideas of service which had prompted the Northampton Company to take in those small gas undertakings. They knew that throughout the length and breadth of the land there were many instances in which large undertakings would say that there was not sufficient guarantee; and that they therefore could not afford to extend their mains to a particular village. Such undertakings had taken the narrow view instead of the broad one, and the Gas Industry had undoubtedly suffered as a

result of the larger undertakings, with all their scope and resources, not being prepared to go forward and take what they believed to be the great risk of linking up the small undertakings of anything from 5 to 20 millions output. In fact, it was not only a question of linking up the small undertakings, for many of them knew of instances where large undertakings had considered taking over concerns of 100 millions, but distances of ten miles had prevented them from taking the risk. Therefore, said Col. Carr, they did admire what had been done at Northampton; Col. Eunson and his Company deserved—and they would, he knew, reap—a rich reward from their courage and foresight in going forward and supplying the small undertakings within the area.

It was not merely a matter of linking up the gas supply; it was something much greater. Good as any of them might be at their particular job, there was none who could know everything even about his own business. In the small undertakings the manager had in the past to fulfil almost every position from secretary and accountant to stoker; he was expected to carry out duties beyond the capacity of any human being. He could not expect to be up-to-date in the latest methods of service and salesmanship as well as being efficient in the operation of the production plant. The linking up and grouping under larger undertakings brought advantages not only in the supply of gas, but in the more varied brains available for the different requirements. This point Col. Eunson had indicated in his reference to training of fitters. By this means they were able to get specialists into the villages which they would never have reached if they had not taken over the small undertakings. If they were best to meet competition, he suggested that it was in such consolidation that lay the future strength and prosperity of their Industry.

Proposed Alteration of Institution By-Laws.

Continuing, Col. Carr said that he would like to refer to a matter in connection with The Institution of Gas Engineers. As they knew, the Council had had under consideration for a number of years the revision of their by-laws. The by-laws as originally drafted when the Institution was granted its Charter contained certain restrictions which in practice had proved somewhat onerous. He referred, for example, to the fact that graduates seeking admission to the Institution could only obtain that admission provided they had graduated at Leeds University. There were, however, other Universities conducting work in connection with fuel technology where graduates might take a degree, which, in the opinion of the Council, might be considered equivalent to the Leeds degree, provided the graduate satisfied the other conditions in regard to experience and training in a gas-works. He mentioned this as one circumstance; but there was, as they knew, a still greater one—namely, that many of their technical workers could not be admitted to corporate membership. It was a fact that to-day they were actually having to co-opt on to their Research Committees the men who were active in the technical work of the Industry, but yet were not eligible for corporate membership of the Institution.

The Council felt that The Institution of Gas Engineers should be made, if possible, representative of the whole of the technical work of the Gas Industry, and that it should embrace within its corporate membership all technical workers who were qualified for such membership.

Col. Carr observed that he did not propose to go into the details of the proposals, but the Council had that week decided that they should be placed before the members of the Institution at the Annual Meeting at the end of May, and that they should then call an Extraordinary General Meeting for the purpose of approving them or otherwise, this to coincide with the Autumn Research Meeting in November. He thought that the suggestions put forward by the Council would be agreeable and acceptable to the majority of members. They might desire further consideration in order that the proposals might be modified, but he wanted to emphasize that all corporate members would be given full time to consider the proposals, and opportunity would be afforded if they desired to express other views before recording whether they were in favour or not. He had heard it voiced in some quarters that there was danger in alteration being made without properly ascertaining the views of the corporate members as a whole. But he assured them that the Council would be most careful that whatever was done would be done at the desire and behest of the majority of the corporate members of the Institution.

A Coke Selling Scheme.

Col. Carr went on to refer to the work of the Midland Association in connection with the coke selling scheme. They all knew of the central coal selling scheme, he said, which had just come into being, and they feared that its operation might be such as to lead to discrimination against their Industry in connection with the price of coal. This made it more necessary for all to work closely together in this respect. It might be equally necessary to set up a closer liaison with the coke oven interests. In the Midlands they might not, perhaps, feel coke oven competition quite as much as they did in Lancashire and Yorkshire; but he knew they did feel it. He would go so far as to say that he hoped they would be able to find a means of associating themselves with the coke oven producers by first founding their own organization, consisting of 100% membership, so that they could insist that the oven owners did the same thing in order to prevent wasteful competition. Their scheme must cover not only the Gas Industry but the coke oven industry as well.

In conclusion, Col. Carr said how much he appreciated the privilege of being with them that day, and added his congratulations on the excellent Address which Col. Eunson had given to his Association.

Mr. A. L. Holton (President-Elect of the Manchester District Association of Gas Engineers) extended to the Midland Association and to their President the best wishes of their kindred Association in the Manchester district. There was a link between Col. Eunson and himself, he said, in that John West had a long and happy association with the Manchester Gas Department—and he saw that he received his earlier experience with the Northampton Company. In the same way, Mr. Holton had come to sit at Col. Eunson's feet that day in order that he might execute his duties the following day in Manchester all the better.

Atmospheric Pollution

Condition of Affairs Not Improving

The general cleanness of our atmosphere is not improving. The latest figures noted show a setback when compared with those of the last three years, so that great efforts are called for if an improvement in the state of the atmosphere is to be obtained. This somewhat disturbing conclusion is reached in the 21st Report of the Investigation of Atmospheric Pollution, issued last week by the Department of Scientific and Industrial Research.* The Report contains an analysis of observations made during the twelve months ended March 31, 1935, by the seventy-eight bodies, most of which are municipal authorities, co-operating with the Department in this work.

The greater part of the data presented have been obtained in the 98 deposit gauges, maintained by the co-operating bodies, but in assessing the general state of atmospheric pollution only results are used from a group of 57 stations for which the year's data can be compared with the general average of pollution for the five years 1927-1932. It is pointed out that these figures do not represent an average for the whole country, but simply for those stations which take observations, and that these stations are in fact concentrated in certain parts of the country—mainly in the industrial north.

As in previous years, the data from the deposit gauges gives an estimate for the amount of total solids deposited, arrived at from the following items—tar, other carbonaceous material, including soot and organic dust blown up from the ground, insoluble ash, including mineral dust carried by the wind from road surfaces, &c. These items are grouped as insoluble in rain. The other items which are grouped as soluble include "Soluble Loss on Ignition," representing combustible organic material, volatile products, such as carbon dioxide, ammonium salts, sulphuric acid, &c., and the remainder expressed as soluble ash. Figures for sulphates, chlorine, and ammonia, although included in the above, are also shown separately. The tables in the Report, giving the details of these deposits, show an increase in the deposit of both tar and sulphates at: London (Archbishops Park, Finsbury Park, Golden Lane, and South Kensington), Castleford, Glasgow (Alexandra Park and Ruchill Park), Newcastle-on-Tyne (Town Moor).

The only stations which show a consistent reduction in all the components of deposit during the current year are: London (Southwark Park), Glasgow (Victoria Park),

* 21st Report of the Investigation of Atmospheric Pollution. Report on Observations for the year ended March 31, 1935. Published by H.M. Stationery Office, 5s. net.

Rothamsted, Salford (Peel Park), Wakefield (West Riding Rivers Board).

The total solids deposited were also high at Liverpool (Netherfield Road).

They May Be Doing Their Best.

The Report points out that "the fact that the deposits for a particular town are higher than the average by no means necessarily implies that proper steps are not being taken to deal with the local problems of pollution, nor does the fact that the deposit gauge results in one town are higher than in another necessarily mean that the atmosphere of the first town is more heavily polluted. It is in fact quite as probable that the town in question is making a serious effort to arrive at the real measure of local pollution by placing its gauges in positions where the deposits recorded would be likely to be heaviest. In that case the very real assistance given to this co-operative investigation by the locality in question becomes a matter for appreciative comment. While criticism can more safely be made where the amount of the deposits recorded at the same station shows a consistent increase, it is clear that the only reasonable method of arriving at any comparative criterion of pollution between various districts, or indeed, as stated above, of the degree of pollution in a particular area, is to make use of such a number of recording instruments as will enable the fullest possible account to be taken of the conditions obtaining in each locality."

The report, however, directs attention to the following figures from the tables: At Finsbury Park the deposit figure for "Soluble Loss on Ignition" was 3·27 times the average; ash, at the same station, was 1·83 times the average; and sulphates 3·05 times the average. London, Golden Lane, again had a high tar deposition, amounting to 2·5 times the average, while sulphates at the same station were twice the general average and chlorine 1·5 times. Other deposits well above the average were the tar deposits at Alexandra Park, Glasgow, Kingston-upon-Hull (Suburban), and Newcastle (Town Moor). Rochdale and Rotherham also had high sulphur deposits.

Sulphur Pollution.

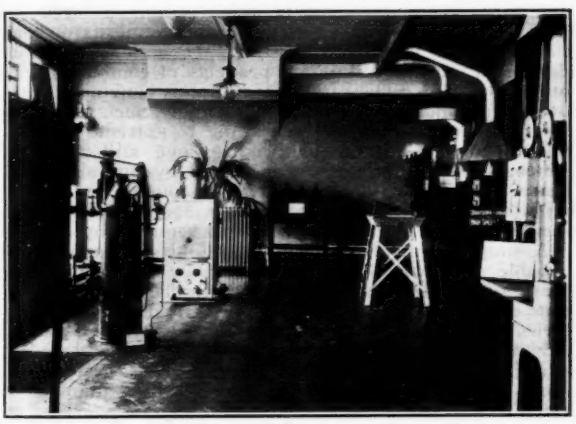
As regards sulphur pollution, the Report states that Cardiff appears to be unusually free from sulphur pollution, as indicated by the figures for both methods. London County Hall, on the other hand, shows some very high figures for active sulphur. In view of the high sulphur results in London, Mr. Coste, Chief Chemist of the London County Council and a member of the Research Committee, was asked to contribute a note to the Report dealing with this matter.

"The London results," he says, "although showing marked seasonal variations which may be attributed, in the main, to increased fuel consumption in winter, are evidently affected to a great extent by other than domestic sources. The southward movement of industrial undertakings and the large number of tall chimneys to be seen all over London may account for the general high sulphur content of London air."

The Industrial Utilization of Gas in Stockport

By R. L. GREAVES,
Assistant Engineer and Manager, Stockport Corporation Gas Department.

From a Paper presented to a Joint Meeting of the Manchester and District and Yorkshire Junior Gas Associations following a visit to Leyland Motors, Ltd., Leyland, on March 4.



A Corner of the Stockport Gas Showrooms.

The present expansion of aviation is bringing new loads to gas undertakings in various large towns. A new works at Stockport has recently installed gas-fired plant which may eventually consume gas in the region of 15,000 cu.ft. per hour. Gas is being used for the normalizing and annealing of component steel parts such as air screws, struts, &c.; for tool hardening; in tinshop work; and for various drying processes.

In my area a new tyre repairing process by Messrs. Henry Simon, Ltd., is carried out with the aid of steam which is raised by a gas-fired boiler. Tyre soling and lorry heating are typical applications of small scale steam raising by gas, the field for which is in its infancy. The consumption of gas is approximately 3 cu.ft. per lb. of steam raised. On this basis the cost per 1,000 lb. of steam is 4s. 6d. with gas at 4d. per therm.

In my area a new gas-fired furnace by British Furnaces, Ltd., has been installed for melting lead for the production of shredded lead. The capacity of the process for which the lead is used is 4 tons per shift, but the furnace actually melts 1 ton of lead in the first hour (from cold) and 1 ton every half-hour thereafter.

The gas consumption has averaged 1,200 cu.ft. (5·4 therms) to the first ton and 750 cu.ft. (3·38 therms) afterwards—*i.e.*, 1·87 lb. per cu.ft. of gas for the first ton and 2·98 lb. per cu.ft. of gas thereafter. The management state that the plant is extremely satisfactory in every respect.

Welding and Cutting.

An important new welding process utilizes coal gas and is therefore of great consequence. It is based on the welding research of Fouche and Picard, who in 1903 recognized that a mixture of coal gas, acetylene, and oxygen had definite advantages over a mixture of acetylene and oxygen alone.

The Barimar Sopromo apparatus makes it possible to mix cheaper gas—*i.e.*, coal gas—with the acetylene gas used for welding purposes for reasons of economy and also to provide a much superior welding flame. The outstanding feature of the flame produced when the mixture of coal gas and acetylene is used in conjunction with oxygen is that the temperature is sufficiently high to melt the metal, but not high enough to boil it. Less oxygen is consumed than with ordinary oxy-acetylene welding. The flame is also "softer" than the ordinary oxy-acetylene flame, and as it has a tendency to "spread out," it constitutes a protecting cover to the molten weld metal. Coal gas from the mains and acetylene gas from a generator are led at normal pressure to a valve which controls the proportions of each gas. The two gases then pass to a mixing chamber, from which they are drawn in a mixed state, and then are passed on to the welding blowpipe by means of a rotary pump or compressor. This rotary pump should operate at 1,370 r.p.m., and it has been found that a ⅝ to ¾ h.p. motor is suitable for driving the pump. With alternating current it is advisable to use a repulsion motor.

After a little experience the rate of welding should be

as fast as ordinary oxy-acetylene, less skill is required, and much work that is at present done by electric welding, because of the effect of oxy-acetylene welding on the steel, could be done more speedily and at much less cost by using the Barimar Sopromo mixture.

The Barimar Sopromo mixing apparatus consists in the main of an equalizing valve, mixing chamber, rotary pump or air compressor, and a small electric motor. All these parts are arranged inside or on a frame about 1 ft. 9 in. by 1 ft. 4 in. by 3 ft. high.

Welding with Coal Gas.

One type of blowpipe using oxy-coal gas is ideal for welding cast iron. Brass, copper, and aluminium can be effectively welded; the low heat generated by the method eliminates all danger of burning the metal. It is not, however, suitable for welding wrought iron. With a simple coal gas welding plant any handyman can do the general repairs of a factory, such as building up the worn parts of machines, filling blow holes in castings, brazing, hardening tips of tools, &c.

Oxy-coal gas impregnated with "Ferrolene" liquid vapour is increasingly finding favour for the welding of light-gauge metal, but is more particularly attractive for metal cutting. "Ferrolene" is charged at 12s. 6d. per 1,000 cu.ft. of gas used, from which charge the gas bill is paid by the suppliers of the "Ferrolene." Coal gas may also be "intensified" by bubbling the gas through liquid benzene in a specially designed apparatus.

Oxygen Cutting.

Oxy-coal gas hand metal cutting pipes are in regular use at Stockport Gas-Works. They have displaced oxy-acetylene cutters on practical merit tests. The saving in fuel cost is such that acetylene previously purchased in cylinders at 95s. per 1,000 cu.ft. has been displaced for this purpose by gas at a maximum rate of 3s. 6d. per 1,000 cu.ft. Demonstrations of cutting have been given to interested local works managers, and sales have resulted. The users have expressed themselves entirely satisfied that claims have been substantiated. Generated acetylene may cost 40s. per 1,000 cu.ft. and waste carbide is objectionable. On the score of cost and cleanliness, therefore, coal gas is capable of displacing generated acetylene entirely for cutting work.

The "Rapid," lever-operated, non-backfiring type burner in use gives a very intense pre-heating flame, making it highly efficient for scrap cutting.

The following are approximate oxygen and gas consumptions, oxygen pressures, and cutting speeds for three thicknesses of steel plate.

Thickness of Plate in Inches.	Coal Gas Consumption. Cu.Ft. per Hour.	Oxygen Consumption. Cu.Ft. per Hour.	Oxygen Pressure per Sq. In.	Cutting Speed in Ft./Hr.
1	35	85-90	40	60
4	65	300	90	30
8	110	430	160	15

Although quite a good cut can be obtained by an experienced hand cutting operator, it will be readily understood that the results cannot be compared with the smooth cut attained as a matter of course by any of the various oxygen cutting machines obtainable. Many such machines are in use in my area, and the cuts are outstanding for their perfect finish.

The promotion of an organization and campaign for the sale of bottled coal gas would, in the author's opinion, meet with unqualified success.

Gas in Dairy Work.

The use of gas in dairy work has not only appealed to gas salesmen as an important new field, but is being carefully investigated by dairymen in the production of sterile milk capable of commanding the best price under the Milk Special Designation Act, 1923, and the Milk and Dairies Order, 1926.

The application of a clean fuel is the first requirement, and the availability of a labourless fuel is valuable.

The principal requirement of the Ministry of Health is that "every milk vessel, lid, or appliance shall be thoroughly washed as soon as may be after use and shall be cleansed and scalded with boiling water or steam before it is used again."

While labour-saving bottle washing machines are used by large dairies, small dairies are presented with problems in the solution of which heat may be applied usefully and economically by gas. In very small dairies an ordinary wash-boiler is often used with an oven superimposed for sterilizing. For all dairies, a proper sterilizing unit is desirable, and small scale steam raising may be adopted by gas-fired boilers feeding independent ovens, or by self-contained gas-fired steam sterilizing ovens. A supply of steam at 10 lb. per sq.in. pressure from a boiler will drive a turbine bottle-brush. The exhaust steam can be used for heating water. The value of entirely automatic feed has been stressed, in contrast to other widely used methods.

The prevalent idea that sterilizing by steam is now compulsory for dairies is erroneous. Cleansing by scalding is the legal requirement. Scientific sterilizing is, however, encouraged, since milk with a low bacteria count will always command the highest price. For this reason steam sterilizing is being voluntarily adopted, though in some cases individual Medical Officers of Health have lately been insisting on steam sterilization. In one instance a Public Health Department states, in a letter to dairies in its area: "The use of boiling water for sterilization of glass bottles has generally been found impracticable and, therefore, to comply with the Order, it will be necessary to provide an approved steam-raising plant and steam chest." Scientific sterilization may well therefore become compulsory in future legislation, in which case a load of no mean dimension may be secured for gas if attractive rates are offered. In this respect the author feels that the use of gas for sterilizing is not limited to steam raising, and that more economical methods should be closely examined. In February, 1934, a Paper appeared in the publication *Industrial Gas* entitled "Sterilizing Milk Cans" by J. C. Marquardt. It is disappointing that apparently no interest has yet been shown in this country in the method described: "A gas-torch flame introduced into cans properly washed and rinsed produces a sanitary can. This plan eliminates steaming to produce heat for sterilization. It also provides a means of drying the can at the same time. The flame does not melt the solder. The flame treatment is gentle and does not blacken or leave contaminating odours. Milk placed in the flame-dried cans is not affected in flavour or quality. The method is rapid, economical, and easily operated." Eight seconds' flaming reduced the bacteria count from 450 million bacterial counts per can to 1,000 counts. The ingenuity of applying a direct flame for sterilizing and the economy and speed claimed are assets which command further research work, and this might establish the merits of flame-torching for sterilizing bottles. Objections regarding danger of cracking, staining, products of combustion, and other supposed difficulties, the author is convinced by his own experiments can be surmounted. Such a method would secure the load for gas owing to extreme economy. Should any objections materialize, one still feels that sterilization by hot air, accompanied by hot air drying, deserves investigation. It must, of course, be borne in mind that these suggested methods are entirely complementary to the cleansing by scalding required by the Acts.

A simple form of gas-heated bottle-drying appliance is capable of drying 300 bottles per hour with an approximate gas consumption of 0·75 therm. The appliance consists of an iron box 6 ft. by 3 ft. by 2 ft. deep containing a series of flues heated from underneath by bunsen burners. Air under pressure is passed over these flues, and finds its exit (heated) through tubes projecting from the top of the box. Such an appliance may well be adapted for sterilizing.

A recent Paper* described the new "Serckulator" apparatus which has been designed by Serck Radiators, Ltd., Greet, Birmingham, as "a small unit which can be adapted to a box type oven or furnace either new or existing." The various uses of heated air produced in such a unit were detailed.

The makers of the unit have recently co-operated with the author in testing the possibilities of hot air sterilization of milk bottles, and a large Midland dairy considers the tests extremely satisfactory. Results are as follows:

Experiment.	Average Estimated Number of Bacteria Removed from the Pint Bottle by 20 C.c. Saline.	Presence of Bacillus Coli.	Reaction in Litmus Milk.
Washed bottles	320	Absent in 1 C c.	None
Washed bottles sterilized for 10 mins. at 150° C.	80	,,	,,
Washed bottles sterlized for 20 mins. at 150° C.	40	,,	,,
Washed bottles sterilized for 30 mins. at 150° C.	Under 20	,,	,,
Washed bottles sterilized for 40 mins. at 150° C.	,,	,,	,,

* Presidential Address, Midland Junior Gas Association, F. L. Atkin. "GAS JOURNAL" for Oct. 23, 1935.

Hatting.

Hatting is a staple trade at Stockport. Felt is softened by placing the hats in gas ovens until the hat will press into the shape required. In the finishing and shaping departments each workman has a small gas stove upon which he heats a small special iron. With this iron he shapes the brim. Another process is to polish the hat with a special heated pad called a " velour." This pad is greased with tallow and heated on the hotplate of the hatter's stove. Each batch of approximately six hats is heated by gas in " coppers " or hollow cylinders. In this process the brim is softened to take the impression of a wooden frame which is in the shape of the brim.

Drying brushes in thermostatically controlled gas ovens, drying ovens for a special new enamelling process, varnish boiling, banana ripening, sugar boiling, canteen equipment, fish frying, printing calico, laundry work, central heating boilers, are among the plant and processes for which the rapid sale of large-scale appliances has continued since the commencement of an industrial gas section at Stockport.

The local Crematorium at the Borough Cemetery operates a gas-fired furnace.

Printing.

In this field the development of the Monomelt system promises to place gas in an impregnable position. A description of this process is omitted here, but the advantages may be summarized thus:

(1) Saving of labour in handling metal.
(2) Saving of gas used in intermediate melting.
(3) Drossing loss reduced by 60%.
(4) Saving of interest charges because a smaller stock of metal suffices. These savings have been shown in practice to amount to ¼d. per pound of metal used.
(5) Improved quality of type.

Gas for Power.

Coal gas is generally offered at lower rates for power than ever before. This is true in my area, where the rate for this use is 4d. per therm. At the same time superior engines are offered at lower capital cost, and the position is now such that the electric motor is not in the unchallenged position that it once held.

Especially in the field of small-power engines of high-class specification does this apply; one refers to use for power in small factories, in fish and chip shops, cobblers' shops, for generating electricity, &c. A silent, economical gas engine for small power purposes (2 h.p.) can be purchased for approximately £22. One firm of manufacturers is preparing to place on the market a new design of such units from 1 h.p. upwards.

Discussion.

Mr. A. K. COLLINGE welcomed the members of the Yorkshire Association, and in opening the discussion, suggested that the reference to flame torching as distinct from steam sterilizing should receive particular attention from the Gas Industry. It was obvious from the tests made by Mr. Greaves that it was an efficient process.

Mr. J. FLETCHER (Wallasey) enquired if the Barimar apparatus was a commercial proposition. It was a well-known fact that the oxy-acetylene flame was too fierce for many jobs, and a mixture of coal gas was much to be preferred. It was of interest to note that recently Wallasey had supplied bottled gas to Fleetwood for demonstration purposes. There was a decided outlet for bottled gas, but Calor Gas had an advantage in the low pressure at which it could be supplied in contradistinction to the high pressure required for bottled coal gas. At Wallasey they hoped to run Leyland 'buses on bottled coal gas, although there were initial difficulties to be overcome.

Mr. J. R. WOOD (Farnworth) said they had just installed a central heating installation in a church, which was proving very efficient and satisfactory.

Mr. GREAVES, replying, said that he had not had any personal experience of brass melting, but the costs given in the Gas Salesman's Pocket Book could be taken as reliable. It was claimed that the Barimar mixer was a success and it was being put forward as a commercial proposition. Gas undertakings should give every assistance in making it a success. There was undoubtedly a definite field for bottled gas. While the present cost of an installation was heavy, Mr. Greaves thought some co-operative scheme should be brought forward to overcome the initial difficulties.

Mr. J. W. CARLTON (President of the Yorkshire Association) proposed a vote of thanks to the author, and this was seconded by Mr. T. CALDWELL (Widnes).

Gas Undertakings' Results

Barnstaple.

Progress is recorded in every direction in the report on the year's trading of the Barnstaple Gas Company. The balance standing to the credit of the profit and loss account amounts to £6,057 out of which the Directors recommend the declaration of a dividend, less income-tax, for the year ended Dec. 31, 1935, at the rate of £13% per annum on the " A " shares and £9 2s.% on the " B " shares. The gas made amounted to 100,740,000 cu.ft. and sales showed an increase of over 4 million cu.ft. The Company are investigating the possibilities of giving Braunton a gas supply. A canvass is now proceeding.

Eastbourne.

The report of the Directors of the Eastbourne Gas Company for the year ended Dec. 31, 1935, states that the Seaford Gas Company was amalgamated with the Company on Jan. 1, 1935. The year's accounts, therefore, contain the figures relating to the combined undertakings. The sale of gas for the year was 3,339,508 therms as compared with 2,904,633. The balance at the credit of the profit and loss account available for final dividends, after payment of the interim dividends in respect of the half-year ended June 30, 1935, and providing for interest charges, &c., is £13,292. The Directors recommend the declaration of dividends for the half-year ended Dec. 31, 1935, being final dividends for the year, at the following rates (all less income-tax)—viz., on the " A " stock at the rate of £8 10s.% per annum, on the " B " stock at the rate of £7% per annum, and on the 5% preference stock at the rate of £5% per annum. These dividends, with the interim dividends already paid, make a total distribution for the year of £8% per annum on the " A " stock, £6 10s.% per annum on the " B " stock, and £5% per annum on the 5% preference stock. The amount required for the final dividends is £12,500, leaving a balance of £792 to be carried forward. In March last, £40,000 4% perpetual debenture stock was issued, the premiums received thereon amounting to £3,000.

Exeter.

The report of the Directors of the Exeter Gaslight and Coke Company for the year ended Dec. 31, 1935, states that there has been a satisfactory increase in the sale of, and revenue derived from, gas. Consumers have shown an increase of 535, bringing the total up to 19,959. Prepayment consumers now account for over 30% of the gas sold. Income from meters during the year exceeded £48,000. Instead of a loss, which in 1933 was over £1,200, the income from sulphate of ammonia products showed last year a yield of £137. The usual dividends for the past six months were recommended by the Board at the following rates per annum less tax: 10½% on the original stock, 7½% on the new ordinary shares, 4% on the preference stock, and 5% on the preference shares.

Hastings (S.E. Gas Corporation).

The Directors' report on the operations of the Hastings and St. Leonards Gas Company for the year states that after paying in respect of the June half-year dividends at the rate of: £7% per annum on the 5% converted stock, £5 10s.% per annum on the 3½% converted stock, £6 8s.% per annum on the 5% additional stock, and after making provision for depreciation and contributing £1,000 to the special purposes fund there is a total available balance of £15,701, out of which the Directors recommend the payment of dividends at the following rates, less income-tax, in respect of the December half-year: £7% per annum on the 5% converted stock, £5 10s.% per annum on the 3½% converted stock, £6 8s.% per annum on the 5% additional stock, which will absorb the sum of £11,283 and leave £4,419 to be carried forward to the credit of the current year. The number of consumers has increased by 575 during the year and there has been a satisfactory demand for appliances. The Company's mains have been extended to Winchelsea Beach, to Staplecross and Vinehall. Mr. R. W. Foot, a Director of South-Eastern Gas Corporation, Ltd., will be proposed for election as an additional Director.

Leyland.

An increase of 4·2% in the sale of gas was reported at the half-yearly meeting of the Leyland Gas Company held at the Gas Offices in Leyland on Feb. 21. The record sale of appliances set up in 1934, when an increase was made of 34% over previous years, has been maintained. Dividends of 5% were declared on the ordinary and preference stocks.

[*Further Undertakings' Results will be found on pp.* 773 & 777.]

LONG SERVICE TO THE GAS INDUSTRY

A number of firms of long standing on the contracting and manufacturing side of the Industry have collaborated with the "JOURNAL" in the production of a series of articles, under the above title.

Cannon Iron Foundries, Ltd.

Founded originally in the year 1826, and known as Edward & Stephen Sheldon, preserved records inform us that the foundry at Deepfields when established covered barely half an acre, and employed not more than 15 or 20 people. However, the smallest seed if set with thought and care will oft bring forth the most prolific plant.

The junior partner, Stephen, apparently either died or retired from the firm, for a little later a catalogue in which kitchen furniture or utensils formed a prominent part was issued under the name of Edward Sheldon. While doubtless having its ups and downs, it is certain that the firm of Edward Sheldon & Co. grew in size and prosperity. At the death of Edward Sheldon the business was continued by his sons-in-law, William Barnett and John Hawthorne, both of whom, unfortunately, passed away comparatively early. The latter left a son, W. H. Hawthorne; and the former a son, Edward Sheldon Barnett, and a daughter.

EDWARD SHELDON
(The founder).

Richard Clayton married this grand-daughter in 1874, and, having devoted his earlier days to the law, he, by reason of marriage, turned his attention to the business interests of the Sheldon family and became actively associated as a partner in the enterprise in 1878. His fitness, capability, and leadership in the new sphere were soon demonstrated, and Mr. Clayton's hand in the affairs of the concern can be traced down to recent times.

In 1884 the title of the firm was changed to that of the Cannon Hollow-ware Company, Ltd., while its diamond jubilee was celebrated by again changing the name to that of the Cannon Iron Foundries, Ltd. Cannon products, from the very commencement, were the means of adding comfort and refinement, in making improved kitchen utensils, to people in all parts of the world. From time to time other departments were added to the firm's activities. The sanitary ware department, for instance, introduced articles made of fine cast iron with a surface of true white porce-

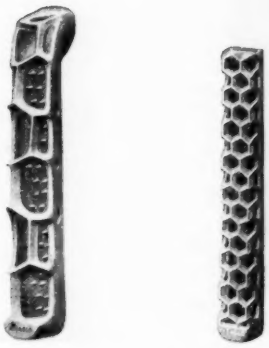
RICHARD CLAYTON.

lain, which is hard, smooth, and non-absorbent. Well-known under the registered trade mark "Porceliron," the products of this department include, besides the usual lines of sanitary fittings, combination and other baths, shower and foot baths, and equipment for use in factories, institutions, &c. The chemical plant department was a further development for the enamelling of pans, stills, condensers, and other vessels as used by manufacturing chemists for evaporating and other purposes. Jacketed pans with the inner pan lined with a hard acid-resisting enamel are tested under steam pressure to 30 lb. per sq.in.

An Elaborate Stand for Gas Fire.

Left.—An Early Type of Cannon Gas Cooker.

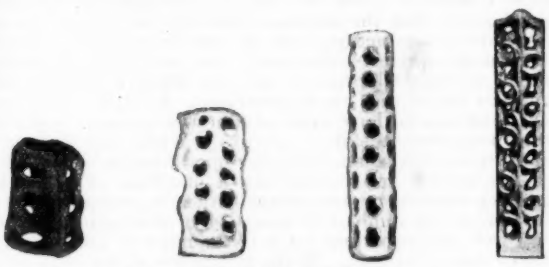
Below.—The Firm's Latest "Vitaglo" Radiants.



Below.—A Cannon Fire of the Victorian Era, with Ball Fuel.

An idea of the enormous variety of sundries in the household and builders ironmongery department can only be formed by perusing the many-paged catalogue illustrating the leading lines. The same remarks are applicable to the general iron foundry and colonial castings section, producing articles that are celebrated throughout the world, such as negro or kaffir pots, Danish, French, African, and other pots, Dutch and Havana stoves, and so forth.

A sharpened tool enables more and better work to be performed; it can therefore modestly be claimed that Cannon grindstones have assisted in the smoother running of life in many odd corners at home and abroad. The grindstone department is responsible for various kinds of quarry



Illustrations of old-type Radiants.

stone, in troughs, for hand, treadle, or with accessories for power drive.

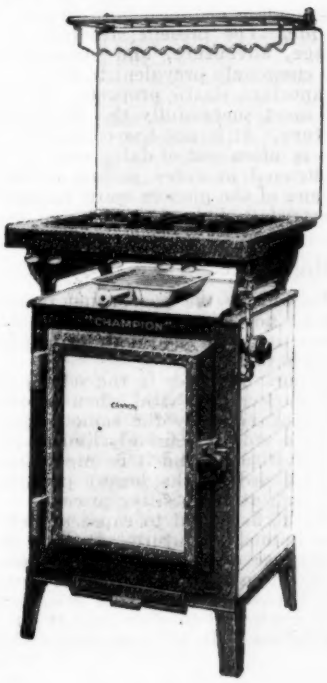
Richard Clayton was, indeed, a Captain of Industry, and he showed great foresight and business acumen in making preparations, in 1895, for the complete manufacture of gas cooking and heating stoves. The gas stove department was at first located in the general works, but it was soon found that this accommodation was inadequate to meet the rapidly growing needs of the department, and entirely new and extensive works were built on another site. Needless to say, this site is now fully covered with extensions and more area still has been embraced. It is interesting to note that quite recently requests have been received for new parts such as hotplate burners for cookers of the earliest types—evidence that in the early stages solid foundations were laid for the ultimate development in the Gas Industry. The fact that some of these earlier cookers are still being used with expressed satisfaction can well be claimed as testimony to the pioneer work of the firm. Not merely content with more than a century of tradition, the skilled application and interest increases, every effort being made to improve the standard and performance of the numerous appliances.

The experience gained in the enamelling department enabled one of the chief factors in the movement of gas cookers to be introduced, as it is now more than 50 years since the enamelling of gas cooker parts for the trade was first carried out at the Cannon Works.

The accompanying illustrations will convey in some measure an idea of the early models of gas appliances produced, reflecting the ornamental vogue of the period; they are also indicative of the tremendous strides made in the Industry since those pioneer days. Self-apparent is the comparison with the latest all-enamelled gas cooker equipped with "Autimo" oven heat control, and the V-inclined gas fire with "Vitaglo" radiants stepped back from the centre and radiating more heat sideways.

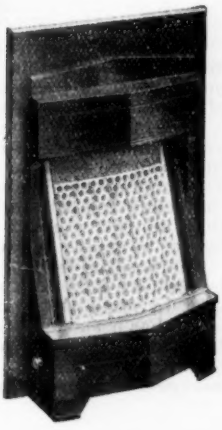
In the gas stove laboratories research work is carried out on the development of new appliances, existing appliances are examined for alteration and improvement, and routine tests are made on materials and fittings. The physical tests made in the cooker testing laboratory do not give all the necessary information about a gas cooker. They must be supplemented by actual cooking tests carried out under scientific conditions in the research kitchen. Only those foods are used which permit of exact repetition and consistency of result. The physical laboratory is equipped with the most modern appliances for testing radiant efficiency and for gas analysis, &c.

The celebration of the Firm's Centenary took the form of an excursion to Blackpool, where employees and friends to the number of 1,000 were royally entertained, 43 servants of the Company being presented with gifts as a recognition of having completed 40 years, or more, of service. Last year saw the close of a long regime as a private Company, and it is significant to note that on the present Directorate there are four great-grandsons of the original founder.



Left.— The "Champion" Gas Cooker—one of which series has been chosen for inclusion in the King's House.

Below. One of Cannon's Patent V-Inclined Gas Fires —the "Veronica."



MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS

THE PRESIDENT.

ALFRED L. HOLTON.

Mr. Alfred L. Holton is a native of Sheffield, and commenced his career in the industry in 1890 under Mr. Fletcher W. Stevenson, Engineer of the Sheffield United Gas Light Company. Commencing in the laboratory, he served in various capacities at each of their three works. He was subsequently appointed Works Chemist and Manager of the By-Products Works in 1899. Three years later he was appointed to a similar position with the Manchester Corporation Gas Department, becoming Works Superintendent at the Bradford Road Gas-Works in 1914. He was appointed to his present position of Chief Engineer at Manchester in 1928. Mr. Holton has always taken a keen interest in the various professional associations connected with the Industry, and he inaugurated the Joint Junior Gas Associations' activities. He was President of the Manchester and District Junior Gas Association in 1911. He is an Institution Silver Medallist.

Presidential Address

OF

ALFRED L. HOLTON

Presented at the Annual Meeting of the Association held at the Midland Hotel, Manchester, on Friday, March 13, 1936.

Each successive President is confronted with a difficulty in his desire to avoid hackneyed phrases in acknowledging the honour conferred upon him by his professional brethren. I shall, therefore, content myself with the short expression " thank you " in all its simplicity, and likewise in its fullest sincerity, and proceed at once to the discussion of a few of the many questions that force themselves on the attention of the Gas Industry at the present time.

A New Outlook.

Progress in the Gas Industry is retarded because of failure to meet quickly the ever-widening range of keen competition, and the never-ending changes, both in social habits and in industrial life. The present situation demands a degree of courage, adventure, and enterprise, greater than that which is commonly prevalent to-day.

Gas still retains those important elastic properties which have enabled it so far to meet successfully the changing conditions of the last century. It is not the commodity, but its adaptation which is often out-of-date, and it is essential that all those engaged in every section of the Industry should develop more of the pioneer spirit to meet the conditions, not of yesterday, but of to-day and to-morrow.

Selling Price.

Demand in general is limited by the purchasing power of the public, but it should not be overlooked that the public invariably endeavours to obtain the greatest amount of satisfaction from its purchases.

Price, therefore, is an important factor in the selling of any commodity, but it is particularly vital when substitutes can be obtained at approximately the same prices. The price at which gas can be sold is definitely limited by the active competition of substitutes, and it is imperative that all costs should be reduced to the lowest possible figure, to enable gas to be sold at competitive prices.

The position in the coalfields is bound to cause anxiety to the Gas Industry in the immediate future. It must be kept in mind that the increase of one shilling per ton, which has been so readily given on existing contracts, more than covers the cost of increased wages on coal delivered to the Gas Industry. It is irrelevant to state that it does not cover the cost of total deliveries to all consumers. The sympathy shown to the miner by the Gas Industry and the country generally should not be exploited by other interests. So far as the Gas Industry is concerned, the position is such that it cannot allow the selfish demands of any other industry to go unchallenged.

An increase in the price of coal was inevitable, and must be met either by an increase in the price of gas, which adversely affects sales, or by economies in working costs. As a further alternative, increased revenue may be obtained from residuals, either by better prices or by improving the quality of the residuals.

There is an unfortunate tendency to assume that finality has been reached on the manufacturing side, and that the present urge is solely for better salesmanship. It must be admitted that the economic difficulty of the present age lies not in production, but in finding suitable markets at economic prices. Machinery has converted production into a mechanical process, and an effective demand does not exist for all that can be produced. Consequently, there is a tendency to look upon production as mere repetition work requiring unskilled labour. While this is true in many industries, manufacturing operations in a gas-works are far more complicated than a machine. Finality has not been reached by any means, either in carbonizing practice, or in the quality or quantity of residuals produced. Research and experimental activity must be continued, or stagnation will result. If the selling price of gas is not to be increased, consequent upon higher costs of raw materials, it is on the manufacturing side that economies must be made, since there is a decided tendency for overhead charges to increase, particularly from the following causes:

(*a*) Additional costs of distribution mains due to consumers being spread over a larger area.
(*b*) The necessity for providing a better sales and service organization.
(*c*) Increased financial obligations due to the operation of Holding Companies.

Two-part tariffs and other selling arrangements are being heralded as the panacea for the present difficulties, but, while they alter the incidence of certain charges, and the result is a more equitable system as between one consumer and another, yet no tariff can reduce manufacturing costs.

A Past President of the Association is reported to have said that " you cannot increase your consumption unless you reduce the price of gas, and, conversely, you cannot reduce the price of gas unless you increase consumption." The effect of increased overhead charges, such as increased sales and service organization, will affect the selling price in the inverse ratio to the consumption.

Salesmanship.

A remark was recently made by a well-known Gas Engineer, that every salesman should be a technician, and the retort was made that every technician should be a salesman. This idea should be further expanded, and everyone connected with the Gas Industry should become a salesman, even if he cannot aspire to being a super-salesman.

All must cultivate a personal interest in their respective jobs, and realize that they have a personal interest at stake.

Greater attention will have to be paid to the training of the outside staff, for the public judge the Gas Industry by them. A smart and competent outside staff sub-consciously impresses the consumer with the fact that gas is up-to-date. If the representatives are not of the right type, or have not been properly trained, then they will not gain the confidence of the public, no matter how good the organization they represent.

Advertising has its place, and showrooms are invaluable, but it is the personal touch that is most effective. The outside staff is a vital connecting link between the executives and the consumers.

It should not be overlooked that the goodwill of consumers is of equal importance to that attached to it by other commercial concerns, even though goodwill does not appear as an asset on the balance-sheet of a gas undertaking.

A bold policy formulated by each and every undertaking, throughout the Industry, and pursued relentlessly and ruthlessly, would result in greater progress. The slogan, "More Gas for Less Money" is applicable both to consumer and employee. With the former, its object is to obtain increased consumption, and with the latter, to secure the exercise of greater efficiency and economy.

Executives—Technical and Commercial.

An industry which has enjoyed a long period of monopoly, and is now feeling the severity of competition, is compelled to review both its organization and personnel, with the object of effectively combating the menace.

It is not surprising therefore to find that where the size of the undertaking requires only one executive officer the old question is again raised—viz.: Does the chief position demand a man with commercial or technical training?

In the larger undertakings, two executives—one technical and the other commercial—may be, and are, advantageously employed.

The right type of training is vital to every successful professional man, and The Institution of Gas Engineers is to be congratulated upon its education scheme, which will undoubtedly improve the status of the future Gas Engineer. But something more than training in engineering is essential for those who hold, or wish to hold, chief executive positions. In addition, there must be those inherent qualities of leadership, which, by example and precept, inspire energy, inventiveness, courage, virility, and confidence among the staff. Those qualities must be widely developed by the ideal executive chief, whether he be commercial or technical.

If a man has the qualifications of a leader he will lead, whether he is technically or commercially trained, but the manufacture of gas, with its residual products, involves a multiplicity of technical processes, and unless an executive head has a good technical knowledge, he is unable to evaluate works' processes or inaugurate new activities. Other things being equal, a technical industry is better administered by a technically trained chief executive officer, for he is able to speak with authority and conviction on the technical side of the industry he is administering.

Mr. E. W. Ashcroft, B.A.—formerly Editor of *World Power*—writing on "Seeking a Career in Engineering," states:

> Some students of engineering will show special capacity for getting business. Salesmanship is the most highly paid branch of engineering, and to-day it *is* a branch of engineering. Only an engineer can sell an oil engine or a turbo-exhauster to another engineer.

Take an analogy from the field of sport. What cricket team could be successfully captained by a man whose qualifications were solely those of an administrator, and who knew little of the technicalities of the game? The successful captain is one who knows how to appraise every phase of the game. His personal encouragement and example bring out the best in every player, and the game of industry should be played in a similar spirit. The man who, in addition to having the qualifications of a leader, is also qualified to take an active part in the technical side of the industry, must be the better leader, for he is able to visualize the undertaking as a whole.

The reason for this difference of opinion in the Gas Industry is largely that the Engineer has not kept pace with the times. In the not very distant past, the *sine qua non* of an Engineer was a superiority complex. He was an Engineer, and everything outside engineering assumed a very secondary place. The principles of administration, economics, salesmanship, chemical control, cost accounts, &c., did not receive sufficient emphasis in the early training of an Engineer. The psychology of industry has changed, and is still changing, and such matters as those mentioned have now become so important and bear so direct a relation to the successful administration of an undertaking, that they cannot be wholly relegated. The principles must be thoroughly understood by every successful executive head. Consequently, if the Engineer does not extend his activities beyond engineering, then he must accept the inevitable and be content to allow others to occupy the executive position. Industry is far too complex to tolerate the leader who can only lead in one direction, for such a chief invariably adopts the tactics of a bully in his methods of control, and becomes a slave to the questionnaire.

Junior Associations.

I had the privilege and the pleasure of being one of the very early members of the Junior Gas Association movement, serving the Manchester and District Junior Gas Association as Secretary for four years, and later being honoured by election as President in 1912. That period synchronized with the rapid development of the Junior Association movement throughout the country, and to-day there are approximately 2,000 members attached to the various Associations. Having been a "Junior" for nearly 40 years, it is not surprising that I am keenly interested in the movement, and regard it as an important factor in the training of the younger members of the profession.

Those who are able to take an extensive retrospective view will agree that there has been a pronounced advance in the general standard of the technical assistant during the last thirty years.

This marked advance may be attributed to:

(1) The rising standard of general and technical education, and, latterly, the influence of the Education Scheme of The Institution of Gas Engineers.
(2) The greater interest shown by Chief Engineers and Managers in the training of general technical assistants.
(3) Last, but by no means least, the beneficial effect of the respective Junior Gas Associations.

I wish to make a very strong plea that every endeavour should be made to increase the prestige of general technical assistants, many of whom cannot perforce obtain chief executive positions, since the supply exceeds the demand. Such a state of affairs tends to be accentuated by the influence of Holding Companies.

The present position is that of an industry engaged in keen competition, controlled by executive leaders who are assisted by trained technical assistants. Competition, to be successfully overcome, demands that the status and prestige of the assistant should be such as to make him a contented assistant, even though aspiring to a higher position. It must always be kept in mind that the assistants have even greater interests at stake than have the older members of the profession, since most of the former are only on the threshold of their respective careers. They are not so conservative in their outlook, are more receptive of new ideas, and have greater vigour to carry them into effect. It is therefore in the interest of the Industry that the assistants should have every opportunity of expressing their views, and be encouraged to do so. Such an attitude towards assistants would give them an added interest in their work, and also fit them to undertake new responsibilities.

The Junior Gas Associations provide an outlet for the enthusiastic assistant to give expression to his views, and, in many cases such views are of more than passing interest.

While a Presidential Address is not the occasion to go into details of the case for further official recognition of the Junior Gas Associations, I am of the opinion that it would be in the interests of the Industry if the link between the Joint Junior Gas Council and The Institution of Gas Engineers were considerably strengthened. The qualifications of the Junior members are such as to make this possible, for a perusal of the names of those attending a recent meeting of the Joint Junior Council showed that 50% had either academic degrees or other professional qualifications.

Holding Companies.

Holding Companies have been described as "this new menace to the Gas Industry." It is certainly very difficult to discern how the obligations of the Gas Industry as a public service are to be any more satisfactorily discharged under new financial arrangements than they are at present.

The advantages claimed for Holding Companies are, undoubtedly, very alluring; but they are mainly theoretical, and, in practice, are rarely realized. For example, it is contended that raw materials and stores can be bought more cheaply in bulk; but the economies that can be effected in that direction are distinctly limited, and the anticipated economies are often offset by other risks. This statement is supported by the fact that one of the greatest

American Trust Combinations—the United States Steel Corporation—has found it advantageous to allow each of its constituent companies to purchase supplies independently.

Where Trusts and Holding Companies have been successful in ordinary industrial undertakings, it will invariably be found that their success is attributable, not so much to increased efficiency in working, as to the creation of a monopoly by eliminating competitors, or controlling the market, thereby enforcing higher prices. But it is impossible to achieve such a position at the present time so far as the Gas Industry is concerned.

It may be argued that the Gas Industry is not keeping pace with progress if it does not follow the lead of other great industries by adopting some form of amalgamation. The need for co-ordination between gas undertakings in congested areas is a very real one. Although the risk of failure of supply is practically negligible, how much capital expenditure, both on reserve plant and mains, would have been saved had it been possible to obtain an alternative supply from an adjoining undertaking in case of emergency? In other cases, an undertaking may have surplus plant, while an adjoining area has not sufficient, and yet no serious efforts are made to arrange a bulk supply. It is the necessity for greater co-ordination which has undoubtedly given a fillip to Holding Companies. But is it necessary for Holding Companies to be formed for that purpose, and can maximum efficiencies be secured only by the formation of them? Surely a combination of the respective gas undertakings themselves could carry out the necessary co-ordination in a far more satisfactory and economical manner. Instead of forming Holding Companies, why should there not be formed District Gas Boards?

Holding Companies have no power compulsorily to acquire undertakings, and their ultimate success is dependent largely upon the linking up of undertakings in a definite geographical area of limited size. Where some of the undertakings belong to local authorities, and others to Companies, an obstacle is encountered by the Holding Company that is difficult to surmount. It has already been observed that high prices are being paid for undertakings by Holding Companies, resulting in watered capital. Overcapitalization means that new capital can be raised only on unfavourable terms, thus adding to the total costs of production. It is almost an inherent characteristic of Holding Companies to inflate capital, whereas it has always been the policy of well managed gas companies to keep their capital at the lowest figure, while the operation of sinking funds, in the case of corporation undertakings, is, in effect, continuously reducing the capital account.

If the promoters of Holding Companies are genuinely interested in the Gas Industry, apart from financial gain, they would find far more scope for effecting improvement by the formation of a vertical combine whereby control is exercised from the raw materials to the finished products, than by forming a horizontal combine by the purchase of gas undertakings. Holding Companies could more usefully extend their activities to providing suitable raw materials at economic prices, and by obtaining for the Gas Industry a full share of the value of its residuals and by-products, rather than by purchasing gas undertakings at high prices. To have an assured supply of clean coal at reasonable prices would be of inestimable value, and if the formation of coal selling schemes means that free competition is to be abolished, then it may be essential for the Gas Industry to acquire control of its raw material.

The economies that would arise by gas undertakings taking the whole of the output of suitable collieries need not be detailed, but such a course would undoubtedly reduce overhead charges, provide a reasonable wage for the miner, and also make possible a reduction in the price of coal to gas undertakings. An increase in revenue could be obtained if there existed better marketing of residuals and by-products. The Gas Industry parts with its birthright too easily if it does not obtain the maximum benefits from its valuable residuals and by-products. I am aware that there already exist co-partnerships and selling schemes for the disposal of certain by-products and residuals. Such schemes, however, introduce a partner who shares in the prosperity of the Industry with the minimum risk of trading and capital losses. Are we now to admit another partner, who will be more interested in finance and dividends, than in providing a public service? I have no wish to underestimate the services rendered by finance. Such services should definitely be recompensed by an adequate dividend commensurate with the risk involved, but the Gas Industry must not be allowed to become the sport of financiers.

Low-Temperature Carbonization.

The Gas Engineer of a past generation was essentially concerned with gas lighting, and he left out of his serious study the coke oven industry. This phase has passed, and to-day the coke oven has become one of our carbonizing units. At the present time the process of carbonizing at low temperatures is very definitely emerging from its early stages, and there are some promising processes in actual operation. The carbonization of coal at low temperatures should not be segregated as a sister industry as were coke ovens, for the gas-works of the future should deal with all processes of carbonization. The largest undertaking in our Industry is known as the Gas Light and *COKE* Company.

The demand for a solid smokeless fuel superior to the best domestic coke from high temperature carbonization is a growing demand, and will be met by the Engineer who seeks to supply what the public require, as well as what he thinks, in his wisdom, would be for their good. There is a growing public feeling against the abominable smoke pall occasioned by the burning of soft coal in the domestic grate, and the publicity given to the resolutions adopted by the Manchester City Council surprised all those who were directly associated with the Enquiry.

The resolutions were as follows:

(1) That the Housing Committee be instructed by the Council as an experiment to make provision, say, in fifty Corporation houses for grates to be specially adapted to burn coke instead of coal, and to arrange that for a period of twelve months coke supplied by the Manchester Corporation Gas Department shall be burned in such houses instead of coal. Further, to instruct the Housing Committee at the expiration of the twelve months' period to report to the Council through the General and Parliamentary Committee upon the results of the experiment from the point of view of efficiency and economy.

(2) That the Town Hall Committee be instructed by the Council to carry out in such offices within the Town Hall, as may be found suitable for the purpose, experiments both with ordinary coke as supplied by the Manchester Corporation Gas Department and low-temperature fuels supplied by outside firms, and to report to the Council through the General and Parliamentary Committee the results of the experiments after they have been in operation for a period of twelve months.

(3) That the Gas Committee be instructed by the Council to consider the question of the installation of a plant to produce low-temperature carbonization fuel and report to the Council through the General and Parliamentary Committee on the subject both from the economic aspect and also from the point of view of stimulating the use of smokeless fuel in the City.

It is of more than passing interest to review what would be the position in Manchester, assuming that legislation precluded the use of soft coal.

The present demand for soft coal for domestic purposes is approximately 750,000 tons per annum, and while the ultra Gas Engineer would argue that this should all be replaced by gaseous heating, such a possibility is, very definitely, in the long distant future. I am, however, convinced that there are possibilities, governed by price and salesmanship, of substituting, say, 50% of this demand by gaseous heating—leaving approximately 375,000 tons of solid fuel for open fires. Assuming a heating efficiency of coke to coal in the ratio of 5-4, we require approximately 300,000 tons of smokeless fuel per annum. Of this, 50,000 tons could be supplied from high-temperature domestic coke, without interfering with industrial sales, leaving 250,000 tons to be met by low-temperature fuel. Now, for the purpose of argument and review, if we assume a low-temperature plant to be in operation, we should obtain approximately the following products per annum:

1,750,000 thou. cu.ft. of gas of 700 B.Th.U.
1,500,000 gallons of Diesel oil.
2,000,000 gallons of spirit.

The two latter products would more than meet the annual requirements of the Manchester Corporation Transport Department for Diesel oil and spirit, which are approximately:

1,000,000 gallons of Diesel oil.
2,000,000 gallons of spirit.

Technical Improvements at Manchester.

I now wish to devote the second part of my Address to recent technical improvements in the Manchester Gas Undertaking.

Owing to severe trade depression in Lancashire during the last few years, and also to the effects of one of the most extensive slum clearance schemes in the country, no extensions of carbonizing plant have been necessary in Manchester. This position has necessitated the strictest economy in manufacturing processes, and it has also demanded investigation into every possible source of revenue.

Benzole plants have been erected at each of the Works, but as these follow the usual practice they do not call for any special comment.

Reconstruction of Rochdale Road Works.

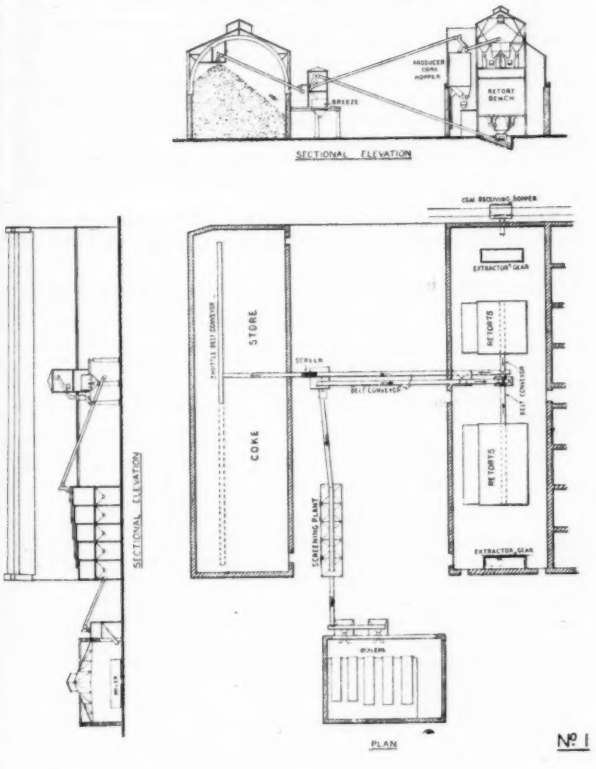
By virtue of its position in the City, the Rochdale Road Works enjoy an active market both for industrial and domestic grades of coke. This was one of the main factors influencing the decision to maintain the Works as a manufacturing unit until a change occurred in economic conditions.

After a careful survey of the carbonizing plant, it was decided that the horizontal house, which had a daily capacity of 1½ million cu.ft., was obsolete, and it was closed down as soon as possible. The other retort house consisted of 16 beds of pre-war Glover-West vertical retorts, arranged in two benches of 64 retorts each. The maximum capacity of the whole house was 4 million cu.ft. per day.

The coke handling plant of the Glover-West house was obsolete, and the lay-out caused repeated breakdowns and delays. The coke was brought from the house in telpher skips mounted on bogies, which were run in trains of two, and drawn by an electric locomotive. The railway, sunk as it was in a gulley, immediately under the bottom castings, made maintenance a difficult and expensive proposition, and the slowness of the operation necessitated the trains being run continuously throughout 24 hours when the house was on full work. After removal from the retort house, the skips were taken by telpher, either to the screens or to the hoppers.

MANCHESTER CORPORATION GAS DEPT. ROCHDALE ROAD WORKS.

COKE HANDLING SCHEME.



No. 1

It was finally decided to replace the old vertical installation with Glover-West latest type of 30-in. retorts, the work being carried out in two sections—three beds one year, and four beds two years later. Special consideration was given to the design and lay-out of the new coke handling plant.

The heating system of the new retorts employs the calibrated nostril arrangement for the producer gas, and has resulted in an even and easily controlled temperature in the combustion chambers. A waste-heat boiler of 17,000 lbs. per hour capacity was also installed, arranged so as to take the waste gases from either, or both, of the two new benches, a steam turbine-driven fan supplying the necessary draught. A rotary pump driven from the extractor gearing lifts hot waste water from the gas condensers to the boiler supply tank and, since the feed water is further heated by means of a heater operating on the turbine exhaust, a very economical boiler plant is ensured.

The coke handling scheme is shown in fig. 1, from which it will be observed that coke is carried direct from the settings by means of two 24-in. belt conveyors to the centre of the house. It is then conveyed by a transverse inclined belt to a junction house situated on the railway gantry, where, by means of directional discharge shoots, the coke can be sent to any of the following points:

(*a*) Direct to C.C.L. de-breezing screen, the clean coke being deposited in railway wagons, the breeze being collected in a hopper directly under the junction house.

(*b*) By means of an additional belt, to a hopper fitted with automatic telpher-skip filling gear. From this hopper the telpher conveys coke, either to the screens as before, or into stock.

(*c*) To an inclined belt, which conveys the coke to the new producer feed hopper.

(*d*) To a series of hoppers and grading screens arranged on the railway gantry and fed by a belt conveyor from the junction house. The coke can be graded as received direct from the retort house, or first passed through the breaker. The belt itself is arranged to take the breeze collected from the C.C.L. screen and carry it to the main storage hoppers and screens.

(*e*) A small belt conveyor is to be arranged, as shown, to supply the Lancashire boiler plant with fuel.

The system of belt conveyors has provided several interesting points for consideration. As originally operated on the first three beds, a light spray of water was played on the collecting belt under the bench, where it not only served the purpose of damping the belt, but also of washing the belt clean of adhering grit. It has been found that this water, charged with grit, can easily be dealt with by means of centrifugal pumps, and so removed to a convenient place for draining and easy disposal.

The belt on the second installation has been worked dry from the commencement, and, since no damage to the rubber has resulted, the dry system is being adopted.

The only serious drawback to the conveying system has proved to be dust at positions where the coke changes direction of travel—*e.g.*, from retort discharge-door to the skip, skip to belt, and from belt to belt. A series of experiments using a fan has shown that this dust nuisance is not insurmountable, and a dust extraction plant embodying several new features is now being developed.

Any doubt as to the durability of rubber conveying belts when dealing with the coke discharged direct from the retorts has been allayed by the fact that the first belt has now been in continuous operation for two and a half years without trouble, and with little wear, belt fasteners being the only renewals required.

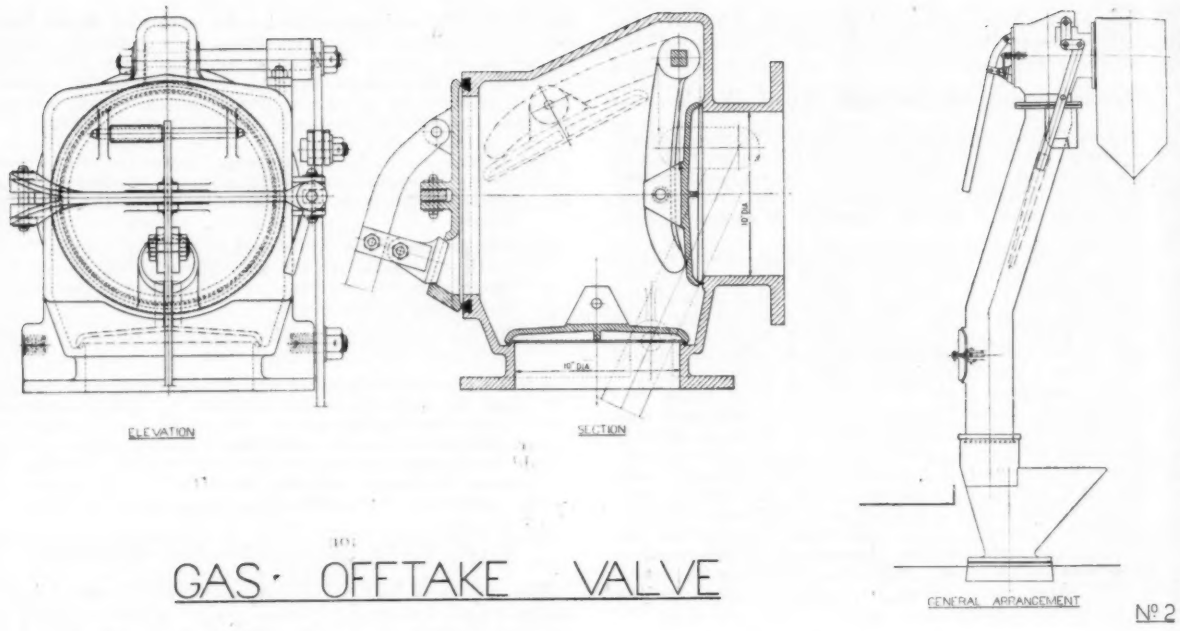
As a result of the experience gained on the first settings, the later beds were fitted with special gas-off-take valves as shown in fig. 2, from which it will be observed that the top portion is hinged, and that provision is made for dropping a disc into the top of the off-take pipe. This has enabled the valves to be cleaned and inspected at each scurfing period and, in addition, provides a safeguard in case of a faulty valve drawing air during scurfing. Working conditions during scurfing periods have been greatly improved by taking advantage of the remarkable heat-reflecting properties of aluminium. A set of aluminium sheets is hung against the scurfing beds, suitably suspended by hooks and the device has been much appreciated by the workmen.

The tendency for poking rods to damage the top section of the retort is obviated by fitting the underside of the plates which carry the rodding ball with a lug projecting into the retort and of the correct size and shape.

Tar Circulation and Detarrer.

In the Paper entitled "The Treatment and Partial Distillation of Tar by Hot Crude Gases," which was presented to the Association on Oct. 27, 1933, details were given of the Cooke-Holton tar circulating system, as applied to the West's vertical retort setting at Partington. Since the date of the Paper, the process has been in almost continuous operation, and has produced, without difficulty, road tar to the British Standard Specifications. It may be recalled that in April, 1932, the Works main road was treated with road tar prepared by this process. The road has been subjected to continuous use, and has given complete satisfaction. During the coming season it is intended to give the road a top dressing—the first since the original treatment.

With the tar circulating system it has been found, as was anticipated, that the condensates at the primary condensers were somewhat lighter in character than the normal condenser tar, though both deposits contain the entrained tar from the gas stream. The high proportion



of tar in the condensates at Partington is indicated in Table I.

TABLE I.—*Deposits at Primary Condensers (Battery of Three Carbonization West's System.*

Tar circulation system working (without detarrer) dry tar recovered—5·47 gallons per ton of coal carbonized.

—	Condenser.			P. & A. Tar Extractor.
	No. 1.	No. 2.	No. 3.	
Temperature of gas entering, °C	70	57	37	30
Specific gravity (wet), at 60° F.	1·071	1·059	1·035	1·035
Water content, % by volume	10	7	1	3
Distillation of dry tar—				
Up to 200° C., % by weight	6·1	9·0	22·1	25·4
200° C. to 230° ,, ,, ,,	15·3	20·4	20·5	20·1
230° ,, ,, 270° ,, ,, ,,	11·7	12·9	12·6	10·6
270° ,, ,, 300° ,, ,, ,,	6·7	7·1	5·2	5·2
300° ,, ,, 360° ,, ,, ,,	16·9	14·9	11·2	11·7
Pitch	43·3	35·7	28·4	27·0
Tar acids in tar, % by volume	10·8	11·0	11·0	11·8

Consideration was therefore given to the possibility of removing the entrained tar from the gas stream before the condensers, thus making possible a further step in the general scheme of fractional condensation. An electrostatic tar precipitator in the hot gas stream was decided upon, as giving the highest efficiency.

A Whessoe-Woodall-Duckham Electro-Detarrer was erected, a description of which may be found in the "GAS JOURNAL" for Jan. 22, 1936. The detarrer was brought into operation in September, 1935, and has been in satisfactory operation since that date. The usual "teething" troubles were experienced, mainly in connection with the breakage of treater wires. This is the first detarrer to operate successfully at subnormal pressures, and at temperatures up to 85° C. Experiments were made at higher temperatures (85°-95° C.) but difficulties were experienced owing to short circuiting.

There has been no difficulty in maintaining a high efficiency in the removal of tar-fog (see Table II.).

TABLE II.—*Efficiency of Detarrer.*

Grains of Tar per 100 Cu.Ft. of Gas (60° F. and 30 In. Hg.).		Efficiency.
Inlet.	Outlet.	%
2,500	7·0	99·72
2,700	5·0	99·81
2,750	4·5	99·84
2,700	7·0	99·74
2,400	5·2	99·78
2,537	5·2	99·80
2,930	4·5	99·85
Average 2,645	5·5	99·79

Many advantages may be expected from the use of the detarrer.

In normal practice some difficulty was experienced with the P. & A. tar extractors (which, at Partington, follow the primary condensers), and back pressures amounting to from 3 in. W.G. to 6 in. W.G. according to the condition of the baskets, were common. It was necessary to dismantle and clean out the P. & A. extractors every two or three months, a somewhat costly operation. Since the installation of the detarrer the P. & A. tar extractors on this stream of gas have been unnecessary. As the detarrer itself gives a back pressure of only 0·1 in. to 0·2 in. W.G. there is a net pressure reduction of at least 2·8 in., rising to 5·9 in. W.G.

The improved character of the oils deposited at the condensers is indicated by the analyses shown in Table III.

TABLE III.—*Tests of Oils from Condensers (West's System).*

DETARRER WORKING.

Reference	A	B	C	D	E	F
Specific gravity at 60° F.	0·95	0·952	0·95	0·953	0·954	0·953
Distillation—						
Drop, °C	118	..	148	114	116	125
% by volume at 120° C.	..	..	..	½	½	..
,, ,, 160 ,,	2	2	1	2	2	1½
,, ,, 175 ,,	5	4	4	6	7	5
,, ,, 180 ,,	7	6	6	10	10	9
,, ,, 190 ,,	17	16	18	20	19	23
,, ,, 200 ,,	33	34	39	42	40	42
,, ,, 210 ,,	59	60	60	62	61	60
,, ,, 215 ,,	70	69	68	69	70	67
,, ,, 220 ,,	76	77	77	74	75	73
,, ,, 230 ,,	85	85	89	83	83	82
,, ,, 240 ,,	91	89	94	88	89	87
,, ,, 250 ,,	95	93	96	93	93	91
,, ,, 255 ,,	..	95	..	94	95	92
,, ,, 260 ,,	..	..	..	..	..	93
,, ,, 270 ,,	..	..	..	..	..	94
,, ,, 280 ,,	..	..	..	..	..	95
Tar acids—						
% by volume	12·5	15·4	13·8	14	..	13·2

It will be noted that the high boiling portion of the oils is small. The free carbon content is very low, suggesting that the residue on distillation contains very little actual tar. The oils are marketed as creosote at normal prices, the last market quotations being 4¾d. to 5d. per gallon.

The tests and qualities of the tar deposited at the detarrer under various conditions are given in Table IV.

The temperature of the gas at the inlet to the detarrer was controlled as far as possible by the use of liquor sprays and a supplementary condenser. Tests and quantities of the oil at the condensers under corresponding conditions are given in Table V.

Both the tar deposits at the detarrer and the oils at the condensers vary in quantity and quality, according to the general conditions prevailing. The quantity of tar in the circulating system, the period of circulation, the temperature in the circulating mains, and the temperature of the tar at the detarrer all necessarily affect the results.

Changes in the quantity and quality of the tar deposits may be expected to bring about complementary changes in the oils at the condensers.

TABLE IV.—*Tar Samples from Detarrer.*

Reference	A	B	C	D	E
Temperature at inlet of detarrer, average °C.	63·1	77·0	62·5	75·1	75·7
Tar circulation system	(not working)		(— Working —)		
Viscosity of road tar, secs.	..	..	7	7	45
Water, % by volume	34·3	15·7	35·6	15·5	14·9
Specific gravity of dry tar at 60° F.	1·102	1·128	1·101	1·105	1·117
Distillation of dry tar—					
Up to 175° C., % by volume	0·76	0·6	1·44	0·45	0·59
175° C. to 215° ,, ,, ,,	4·8	2·16	7·56	6·15	4·34
215° ,, 230° ,, ,, ,,	6·0	3·61	9·1	7·7	5·67
230° ,, 270° ,, ,, ,,	16·6	13·12	22·9	18·0	15·75
270° ,, Pitch, ,, ,,	18·7	15·0	14·5	18·2	15·05
Pitch, % by weight	55·5	68·1	46·0	51·4	60·9
Tar acids (calculated on dry tar)—					
Up to 215° C., % by volume	1·98	1·16	3·05	2·70	1·85
215° C. to 230° ,, ,, ,,	2·44	1·61	3·61	3·22	2·34
230° ,, 270° ,, ,, ,,	5·64	4·45	6·56	5·86	5·11
Tar recovered per 24 hours—					
Wet tar, galls.	1,368	1,200	1,008	1,368	1,368
Dry tar, ,,	899	1,012	649	1,156	1,164
Temperatures at detarrer—					
Inlet, average °C.	63·1	77·0	62·5	75·1	75·7
Outlet, ,, ,,	63·25	75·6	62·7	73·9	74·7
Inlet, maximum °C.	65½	83	66½	76½	82
Inlet, minimum ,,	60½	71	57½	72	73½
Outlet, maximum ,,	65	82	69	75	79
Outlet, minimum ,,	60½	70	58	71	72½

TABLE V.—*Oils from (West's) Primary Condensers*

Reference	A	B	C	D	E
Temperature at inlet of detarrer, °C.	63·0	77·0	62·5	75·0	75·7
Temperature at inlet of condensers, °C	60	70·6	60	68·9	70
Tar circulation system	(Not working)		(— Working —)		
Viscosity of road tar, secs.	..	..	7	7	45
Specific gravity of oil at 60° F.	0·940	0·963	0·943	0·957	0·959
Distillations, % by volume—					
To 120° C.	..	3	½	½	½
,, 160° ,,	1	4½	1	4½	1
,, 175° ,,	3½	6½	6½	10½	2
,, 180° ,,	5	7½	11½	13½	2½
,, 190° ,,	14½	17	26	26½	7
,, 200° ,,	36½	31½	44	48	27
,, 210° ,,	56	53½	65	67½	48
,, 215° ,,	64½	62	72½	76	58½
,, 220° ,,	74	70½	79	82	68
,, 230° ,,	84½	79½	88	89	80½
,, 240° ,,	90	86	92	93	88
,, 250° ,,	93½	89	93	94½	92
,, 255° ,,	..	..	..	96	..
,, 260° ,,	91½	92	94	..	93½
,, 270° ,,	97	..	96	..	95
,, 280° ,,	..	..	..	..	96
Tar acids, % by volume	13	13·7	11	13·2	16
Quantity per 24 hours	216	390	270	630	407

While there are many interesting points for continued and detailed investigation of the controlling factors and their corresponding effects, the process is one which is easy to operate. It also gives a definite financial gain approximating to 1s. per ton of coal at current market prices.

The calculation is based on the following figure:

Prior to installation—
Raw tar . . . 13 gallons per ton of coal

With tar circulation system and detarrer—
Road tar . . 10 gallons per ton of coal (40–45 secs. viscosity)
Oils . . . 2·4 ,, ,, ,,

There is every reason to anticipate that the reduction in tar fog content of the gas leaving the condensers and ultimately entering the purifiers will result in a reduction of the tarry matter content of the spent oxide.

It is well known that the presence of tar fog in the gas is responsible for much of the "sludging" of the wash oil used in benzole extraction. This difficulty should be generally improved or eliminated by the almost complete removal of tar fog from the gas.

The experience gained also indicates an improvement in the O/A figure of the waste liquor from the ammonia stills. This is no doubt due to the fact that the tar is eliminated from the system before the general condensation of the liquor, and the contact of liquor and tar is reduced to a minimum. In this connection, the following tests of waste liquor from the sulphate of ammonia plant are of interest:

Waste Liquors.

Date.	Conditions.	Tests. Phenol, Gms. per 1 Litre.	Total O/A Found (4 Hrs.). 27° C.	O/A Due to Pheno.	Residual O/A.
Jan., 1931, to Sept., 1932	Normal working	0·33	298	59	239
Jan., 1934, to Dec., 1934	Tar circulation system working	0·48	337	85	252
Oct., 1935, to Dec., 1935	Tar circulation system and detarrer working	0·37	198	66	132

The liquor in question is a mixture of that from the vertical and horizontal systems, only the former system having a detarrer installed. Had it been possible to separate the two liquors, improvement in the waste liquor would have been more marked.

Street Lighting.

Since the introduction of electric lighting on a practical basis it has been erroneously assumed, even by those engaged in the Industry, that the death knell of gas lighting has been sounded. In spite of the apathy which such an outlook engenders, gas lighting is a very important load, especially for street lighting. The increased interest now focussed on this subject makes it imperative that the Gas Industry should be prepared with new ideas and schemes, ready to take full advantage of all future developments.

A particularly interesting feature in connection with street lighting will be observed by a perusal of the Board of Trade return for Gas Undertakings in Great Britain. The total quantity of gas sold for the year 1934 was slightly lower than that for the peak consumption of 1929, but in contradistinction, the gas sold to local authorities for public lamps increased by 1,850 million cu.ft., or 17%.

Gas has several definite advantages for street lighting, including, *inter alia*, the following:

(1) Freedom from failure.
(2) The larger size of the light source and the consequent lower intrinsic brightness, bringing about reduced glare.
(3) The ability to extinguish a portion of a lamp at midnight.
(4) Natural colour.
(5) Fog penetration.

The question of colour is of definite importance, as it is unfair to shopkeepers to have street lighting which alters the appearance of their commodities to such an extent that it "makes the meat look bad;" or in a similar way, for a holiday resort to use lamps which make everybody look extremely bilious, is surely a suicidal policy to adopt in towns seeking to attract convalescent people.

The lighting of streets in Manchester was formerly under the jurisdiction of a Lighting Sub-Committee, consisting of an equal number of members of the Gas and Electricity Committees, and neutral members of the City Council. In December, 1931, street lighting was placed under the control of a separate sub-committee of the Highways Committee and their Chief Official—the City Engineer. This Committee appointed a Lighting Superintendent, who is quite independent both of the Gas and Electricity Departments. His duties are to advise the Highways Committee on all matters pertaining to street lighting. The Gas and Electricity Departments each control their respective organizations, alterations and additions being made on the instructions of the Highways Committee. The main considerations influencing new lighting installations are price and adaptability, and the new arrangement has worked particularly smoothly, each installation being given impartial consideration.

Experimental work on new installations or new types of lamps is merely a matter of arrangement with the Lighting Superintendent, and at the present time there are test installations of "Supervia," "Kempar," and "London" lamps, together with many other modifications.

The street lighting installation in Manchester consists of 20,250 low-pressure lamps, the units ranging from 2-light to 10-light, while the high-pressure lighting system is by far the largest in the provinces consisting of 1,000 lamps of 1,500 and 1,000 candle-power units.

To ensure the efficiency of the lighting installations the lamps are regularly inspected, and illumination tests are carried out on three nights every week by a photometrist. The whole of the high-pressure system is covered in cycles of three weeks, and such tests are in addition to the

routine inspections by the foreman, and the periodical inspections by the district surveyors. That efficiency is maintained is shown by the following:

(1) One lamp tested regularly two or three times a week over a period of nearly two years gave an average candle-power of 1,038 at 71½° from the vertical. (Guaranteed minimum 800 candle-power—laboratory maximum 1,225 candle-power.)

(2) Five lamps tested regularly once every two or three weeks over a period of three years gave an average candle-power of 997 at 71½° from the vertical. (Guaranteed minimum 800 candle-power—laboratory maximum 1,225 candle-power.)

(3) Six lamps tested regularly once every two or three weeks over a period of three years gave an average candle-power of 687 at 71½° from the vertical. (Guaranteed minimum 400 candle-power—laboratory maximum 825 candle-power.)

There is a special installation of class "A" lighting in St. Peter's Square, where there are twelve 4,500 candle-power high-pressure lamps mounted on tramway poles at a height of approximately 30 ft. Each lamp has three 1,500 candle-power mantles, two being extinguished at 11.30 p.m. The lamps are lighted and extinguished by hand, but the reduction at 11.30 p.m. is by clock controllers, which are of ordinary low-pressure suspension type.

At the present time, the low-pressure system is being converted from manual control to automatic clock controllers. An extensive test is being made of the electro-catalytic ignition type of controller, and also of the Horstmann "Comet" igniter device. Fog by-pass taps are fitted to by-pass controllers. Each of the systems is satisfactory, as indicated by the following table:

Table Showing Percentage of Failures to Operate of Automatic Clock Controllers.

Type of Controller.	Number of Controllers in Test.	Percentage of Failures.
Gas by-pass—upright . . .	757	0·05
Gas by-pass—suspension . .	712	0·04
Catalytic igniter—upright . .	878	0·30
"Comet" igniter—upright. .	100	0·25

The lighting of traffic signs and danger lamps is one of the purposes for which gas, with its freedom from failure, is pre-eminently suitable. This is especially true in the case of illuminated bollards on island refuges, where a failure of the light, and particularly a complete failure, such as an electrical "black out," would cause them to be a positive danger.

In Manchester there are two principal types of illuminated traffic signs:

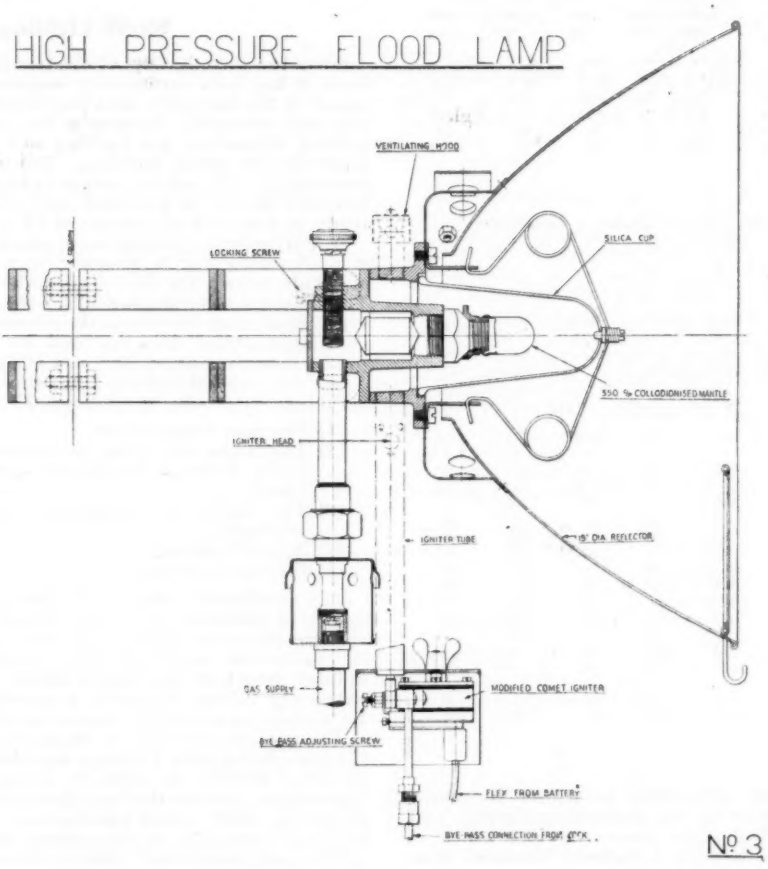
(1) "Day-night" box type reflector signs illuminated at night by a 4-light No. 1 suspension lamp arranged over the top of the sign.

(2) Internally illuminated type, with two No. 2 mantles. The top of the sign is of clear glass in order to illuminate a red disc, or ring, over the top of the sign. A heat-resisting glass is used which will withstand being heated, and then deluged with cold water. A clock controller is arranged inside the sign.

Two types of illuminated bollards are in use:

(*a*) Lighted by two No. 1 mantles. The surface of the bollard is well illuminated, and, in addition, the lantern portion at the top is glazed with opal glass, thus showing a direct light. "Keep Left" or other signs can, of course, be substituted for the opal glass.

(*b*) Lighted by one No. 2 mantle. The bollard is well illuminated, but there is no direct light showing at the top, so that should any traffic instruction be required the sign must be separately illuminated.



The Cenotaph in Manchester is floodlit by gas throughout the year, and the designing of a suitable scheme presented many difficulties, since the Cenotaph is situated in the centre of St. Peter's Square, which, as previously stated, has a class "A" illumination. Further, the lamps could only be fixed on tramway standards which are 40 to 50 ft. away from the Cenotaph. It was, therefore, necessary to use a lamp of the projector type, and four such lamps were obtained for experimental purposes. These lamps were for low-pressure gas, and were fitted with three No. 2 size mantles, with a parabolic reflector, which on being tested were found to give a maximum candle-power of 2,700. This was quite inadequate for the purpose, and no great improvement was obtained by fitting even a 5-light burner. The trouble was that the light source was too big to come within the focal point of the

parabolic reflector. It was decided to convert the lamps to high-pressure, and to fix a single 350 candle-power mantle in each lamp. From this a maximum candle-power of 6,000 was then obtained, which was later increased to 8,000 candle-power. Messrs. Keith & Blackman Co., Ltd., were made conversant with the experimental work, and they agreed to make up a projector type lamp for high-pressure gas. A sample lamp was submitted, and, after several modifications had been made, the whole scheme was carried out, and was put into operation in time for Armistice Day, 1935.

The lamps are of unique design (see fig. 3), the following being a brief description:

The mantle is 350 candle-power in size, collodionised type, and is of a short, stubby shape, fixed horizontally. The mantle is arranged at the focal point of a 15-in. diameter chromium plated parabolic reflector. The mantle is enclosed in a silica cup, which is held in position by a spring clip. The waste gases are extracted at the back of the lamp, and they pass round the outside of the burner tube to provide superheating. There is no secondary air supply, all the air for combustion being taken in at the primary air inlet. The lamp is lighted by a flashing by-pass, which is ignited by a special electro-catalytic igniter, adapted from the Horstmann "Comet" igniter. Advantages of the lamp are that the waste heat gases do not come into contact with the chromium plated reflector, and no opening is necessary above the mantle for the extraction of waste gases.

The lamps were designed to work without any cover glass over the front of the reflector, but in practice it has been found that the reflector, when open to atmosphere, tarnishes very quickly, necessitating very frequent cleaning, and causing a big loss in light output. Experiments have shown that a cover of heat resisting glass over the front of the reflector obviates this trouble. The number of mantles used is rather high, probably due to the horizontal position, and also to the very considerable amount of vibration to which the lamps are subjected, since they are mounted on tramway standards at a very busy corner.

The complete scheme consists of ten high-pressure projector type floodlights, and one 10-light low-pressure suspension lamp with a "Scoop" reflector, used to illuminate one side which cannot be adequately dealt with by the projector lamps. The average illumination on the surface of the Cenotaph has been increased from 2·0 ft. candles to 6·4 ft. candles.

A photometrical laboratory has been equipped at the Gaythorn Works. It is fitted with the latest type of apparatus, including mirror head, photometer bench, &c.; on similar lines to that outlined by Mr. Sugg in his Paper published in the "Gas Journal" on May 24, 1934, but embodying the latest improvements.

Extensive testing apparatus can obviously only be installed by the larger undertakings, but its establishment in Manchester affords an opportunity for that practical helpfulness which is characteristic of the Gas Industry.

Conclusion.

As stated at the commencement, no phase of the Gas Industry has reached finality. Continued investigation and research work must be carried on throughout every section, from the coal mine, through the various processes, to the final utilization of the products, with the object of obtaining the greatest efficiency at the lowest possible cost. On that basis, coupled with increased efficiency, economy, and intelligent salesmanship, the Gas Industry can be assured that the best is yet to be.

MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS

The Annual Meeting

The late King.—Mr. Jennings referred to the loss the country had sustained by the loss of H.M. King George V, and said that the following telegram had been forwarded from the Association to King Edward on Jan. 24:

> *The Members of the Manchester District Association of Gas Engineers desire to express to your Majesty, Queen Mary, and the Members of the Royal Family their Loyal and Respectful Sympathy on the Death of H.M. King George the Fifth.*

The members of the Association then rose in silent token to the memory of the late King.

The late Mr. Hill.—The members of the Association also rose in silent token to the memory of the late Mr. W. Hill, of Stalybridge, who had been a member since 1902 and Hon. Auditor from 1911 to 1934.

The Hon. Secretary (Mr. J. Bridge) announced that letters regretting inability to attend the meeting had been received from, among others, the Presidents and Secretaries of kindred Associations.

New Members.

The following were then elected to membership of the Association:

Mr. W. H. Battersby (Bury).
Mr. J. Corrigan (Brighouse).
Mr. R. Crowther (Ramsbottom).

Annual Report and Statement of Accounts.

The retiring President then referred to the item of Education. The Education Committee of The Institution of Gas Engineers was doing all it possibly could to improve the facilities for the education of students and juniors in the Gas Industry in order that they might make themselves proficient in the career they had adopted. He thought it should be a condition of employment that all apprentices should attend the evening classes appropriate for the Industry to an adequate extent.

The Report and Statement of Accounts were unanimously taken as read.

The Hon. Secretary said that the Statement of Accounts was very satisfactory. The expenditure during the past year had been £19 8s. 10d. less than in the previous year. The year had been commenced with a credit balance of £65 14s. 6d., and ended up with £30 3s. 5d., an increase in the credit balance of £14 8s. 11d. as compared with the previous year.

The Report and Statement of Accounts were unanimously approved and adopted.

Reports of Commercial Sections.

Mr. C. S. Shapley (Leeds) presented the Report of the Yorkshire Commercial Section.

Mr. W. J. Smith (Bolton) presented the Report of the Lancashire Commercial Section.

Both Reports were unanimously approved and adopted.

The Institution Benevolent Fund.

On the motion of Mr. Jennings seconded by Mr. C. S. Shapley it was resolved that a donation of ten guineas and a special contribution of five guineas be granted to the Benevolent Fund of The Institution of Gas Engineers.

Membership of Council of the Institution.

On the motion of Mr. Jennings seconded by Mr. F. G. Shaw (Buxton) it was resolved that Mr. A. L. Holton (Manchester) be appointed the Association's District Member on the Council of The Institution of Gas Engineers.

On the motion of Mr. T. Reynolds (Stockport) and Mr. S. Carter (Liverpool) it was resolved that Messrs. E. Crowther (Salford) and H. Burton (Shipley) be appointed representatives of the Association on the Councils of the Manchester and District and Yorkshire Junior Gas Associations.

Election of Member of Committee.

Col. W. M. CARR proposed and Mr. E. ASTBURY (Liverpool) seconded and the motion was carried unanimously that Mr. G. E. Currier (Bradford) be elected a member of the Committee of the Association in place of Mr. J. T. Haynes, resigned.

The President paid a fitting tribute of appreciation to Mr. J. T. Haynes for the services he had so ungrudgingly rendered to the Association, and wished him every prosperity and success in his new sphere of activities.

On the motion of Mr. H. E. BLOOR (York) seconded by Col. CARR it was resolved that Messrs. E. Crowther, A. L. Holton, T. Reynolds, and W. J. Smith be appointed representatives of the Association on the Lancashire District Gas Education Committee; also, that Messrs. H. Burton, J. E. Lister Cooper, G. E. Currier, and C. W. Ward be appointed representatives of the Association on the Yorkshire District Gas Education Committee.

The New President.

Mr. JENNINGS, introducing Mr. A. L. Holton to the Presidential Chair, said it was now his duty very reluctantly to vacate that chair and to ask Mr. Holton to take over its duties. In doing so he wished him every possible success and happiness.

Mr. Holton then took the Chair and was invested with the Presidential Badge.

The PRESIDENT expressed, on behalf of all the members of the Association, their very keen appreciation of the many services rendered by Mr. Jennings during his year of office, which commenced with an increasing membership, and closed with an increased balance to credit in the bank. They all recognized the wide scope of his activities as their representative on the parent body. He then presented Mr. A. L. Jennings with the Past-President's medal.

Mr. A. L. JENNINGS, responding, said that it had been a very happy year of office, owing to the very active co-operation he had received from the immediate Past-Presidents, the Vice-Presidents, and the Members of the Council. Furthermore, he would like to add that the great bulk of the work of the Association was not done by the President at all, but by their indefatigable Hon. Secretary, Mr. Bridge, who was a real stalwart and support in looking after the interests of the members of the Association at all times. He desired, also, sincerely to thank the members of the Spenborough Council for permitting him to serve the Association as its President during the past year.

The President's Address.

Mr. Holton then read his Presidential Address, which will be found on previous pages of this issue.

Vote of Thanks.

Mr. R. N. WEBB (Leeds) moved that a very cordial vote of thanks be passed to Mr. Holton for his extremely interesting and instructive Address, which was typical of his thoroughness and masterly ability. It was cheering to notice the spirit of optimism with regard to the further progress of the Industry with which it was inspired. It was obvious, as one listened to the description of the avenues of progress that were being opened out, finality had not yet been reached by any means.

Mr. E. ASTBURY (Liverpool) seconded the vote of thanks, pointing out that the keynote of the Address was that the maximum of to-day should be the minimum of to-morrow.

The vote of thanks was carried with acclamation.

The President Replies.

The PRESIDENT in reply said that he would be lacking in gratitude if he did not acknowledge that he owed a great deal of his working success to the ungrudging help he had received from the members of his staff. He wished, also, gratefully to acknowledge the receipt of a telegram from the Engineer and the General Manager of the Company with which he had served his time of apprenticeship, wishing him every success in his new sphere of office. This was followed almost immediately by another telegram, couched in similar terms, from members of his own staff who could not attend the proceedings. The pleasure he felt in taking up the duties of his new office was greatly enhanced by the sympathetic presence of so many members of his Committee, and particularly by the presence of his Chairman, Councillor W. P. Jackson.

An Invitation to Manchester.

Councillor W. P. JACKSON (Chairman of the Manchester Corporation Gas Committee) said that it was a great pleasure to all the members of the Committee to see Mr. Holton installed as President of the Association. The honour which had been conferred upon him, they felt, reflected to some extent at least upon themselves. On behalf of his Committee and himself, he extended a cordial invitation to the members of the Manchester District Association of Gas Engineers to hold their Summer Meeting in Manchester. He felt sure that the visit would be both interesting and instructive.

The President on behalf of the Association very cordially accepted the kind invitation extended to them to visit Manchester on the occasion of their Summer Meeting.

Vote of Thanks to Committee and Officers.

Mr. H. D. ROBINSON (Middleton) moved that a very cordial vote of thanks be passed to the Committee and Officers for their services during the past year, with special reference to Messrs. E. Astbury, J. E. Lister Cooper, and E. Crowther, who retired from the Committee after three years' service, and Mr. J. T. Haynes, who retired after one year's service. Mr. Haynes was taking up another sphere in the Gas Industry, and he was sure that they all wished him the very best of success and health in his new office. The thanks of the members were also due to Mr. R. B. Braddock (Radcliffe) and Mr. Francis Elliott (Leyland) for their most efficient services as auditors. Last, but not least, of course, there was the Secretary Mr. J. Bridge (Elland), who did his work in a very happy and genial manner. He was one of the few men who could go about smilingly asking for subscriptions and subsequently leave those whom he had approached with a smile on their faces also.

Mr. W. BUCKLEY (Manchester) seconded the vote of thanks, which was carried with acclamation.

The HON. SECRETARY (Mr. J. Bridge) responded to the vote of thanks on behalf of the Committee and the Officers of the Association. He was very pleased that Mr. Robinson, in his remarks, mentioned the three retiring members of the Committee; it was very fitting that their services should be recognized in that manner, and that they should not be allowed to think they were being forgotten. Mr. E. Astbury would certainly retain his association with the Committee, inasmuch as he was going forward as Junior Vice-President. The new members of Committee elected by ballot—namely, Mr. A. F. Ames, Darwen, Mr. T. R. Cook, Blackpool, and Mr. H. Singleton, Huddersfield, along with Mr. G. E. Currier, Bradford, who was taking the place of Mr. J. T. Haynes, Rotherham—would commence their duties as members of the Committee from the date of the present meeting. The auditors, Messrs. Braddock and Elliott, had also done their work very efficiently. Continuing, Mr. Bridge said that last year he had stated it had been a great pleasure to him to be the Secretary of the Association. He had had another very happy year of office. It had been a great joy to him to be associated with such an able President as Mr. A. L. Jennings. They had worked very well together. He was quite sure that this next year would be quite as happy as any in the past. There was one matter concerning which he would like to remind them all—namely, the Benevolent Fund of The Institution of Gas Engineers. There were 129 members of the Association who were regular subscribers to the Fund; and there were another 31 members who were members of The Institution of Gas Engineers but who did not subscribe to the Fund. He appealed to those 31 members to get in touch with either the Secretary of the Institution or himself. They would be very pleased to supply them with Bankers Order Forms, so that having signed one they would have no further trouble in regard to the matter of subscriptions for the rest of their lives. There were a number of members in the Association who were eligible for membership of The Institution of Gas Engineers, but they had not claimed that privilege. He hoped they would do so in the immediate future.

Retirement of Mr. J. Bridge.

It was with great regret that he had to state that in entering upon his duties as Hon. Secretary for the present year, it would have to be for the last time. He had hoped to go forward as the Hon. Secretary of the Association for at least ten years. Unfortunately, his doctor was very insistent that he should give up the office. It was a great blow to him because he had enjoyed the work so very much.

At the conclusion of the Proceedings, Col. W. M. CARR (Stretford) appealed for a good attendance of Lancashire members to support him at the Annual Meeting of The Institution of Gas Engineers in May next.

Manchester Association Luncheon

During the course of the luncheon which preceded the Annual Meeting, the retiring PRESIDENT extended a cordial welcome to the guests, among whom were a number of members of the Manchester Corporation Gas Committee and the President of The Institution of Gas Engineers, Col. W. M. Carr, O.B.E., T.D., as well as a number of contractors engaged in the production of gas-making plant. He added that the Gas Industry owed a great debt to gas engineering contractors for the technical and scientific knowledge they had brought to bear, both in regard to the manufacture of gas and its distribution. In his opinion, too little tribute was paid to them for those services. He was also very pleased to welcome the representatives of the Press, who were always willing to give the Industry a degree of publicity which, unfortunately, the Government, on occasion, seemed to be reluctant to vouchsafe to them. Neither did the general public appear to realize that the Gas Industry did more than any other industry to bring about an amelioration of the smoke nuisance. The Industry produced three smokeless fuels—one gaseous, in the form of gas, one in a solid form as coke, and one in liquid form as benzole. There was no doubt that the more the people of this and other countries appreciated the necessity of contributing to smoke abatement, the better it would be for the health of everyone. In the South of England it was interesting to note that an exceedingly high percentage of people in dwelling houses used smokeless fuel in domestic grates in the form of coke, which was ignited by gas pokers, and it was to be hoped that the people in the North would soon follow suit.

The Industry was bounding ahead to-day, just as it was doing a few years ago. He believed that it had a very great future before it, and those who controlled it were doing everything they possibly could to further its interests and those of the consumers whom they served.

Coal and the Gas Industry.

Col. W. M. CARR (Stretford) said that at the last Annual Meeting of the Association he was asked to deputize for Mr. C. Valon Bennett, who was then President of the Institution, and when Mr. Bridge, the Hon. Secretary of the Association, wrote to him and asked him if he would do the same thing this year he was very glad to avail himself of the opportunity of doing so. There were one or two points upon which he would like to make a few remarks. The Industry relying upon coal as its raw material was passing through a period which was fraught with many difficulties. Some of them would have seen the new coal selling schemes, and, of course, many of those who were operating in Lancashire knew something about the selling scheme that was already in operation in that area. He understood that some of his compères would differ with him when he said that, personally, he did not mind paying more for coal as long as he was assured that every other user of the same coal would have to pay a similar amount. What was feared under the coal selling schemes was that there might be discrimination as between the Industry and other public utility undertakings and that the Gas Industry would be impeded thereby. The Government had given powers to the coal owners which transcended in their effect and in their magnitude any powers that had ever been given to any other industry or any other public utility undertaking in the past. Some powers had been granted to the suppliers of gas which were to a certain extent a measure of monopoly, but coal owners had been given monopolistic powers without any degree of control. The powers of gas producers as public utility undertakers were restricted; they were limited in the amount that could be privately owned, they were limited in the amount of dividends they were allowed to pay to their shareholders, and they were limited in the price they were allowed to charge to their consumers. The coal owners had been instructed to form combinations under which they were empowered to charge whatever price they liked to coal users. They were empowered to restrict outputs and to regulate outputs so that they could control them and enforce such prices as they thought fit to impose. It was true that gas undertakers were given the right to appeal to Committees of Investigation, but when they looked at such Committees of Investigation what did they see? They were composed of one coal owner, one miner, one representative of the public, who spent himself in coal perhaps £2 or £3 a year at the most and might not be very much influenced about the price that was charged to manufacturers or utility undertakings, fourthly a member of industry, and fifthly an independent Chairman. It was feared that such Committees would not have the knowledge or the experience which would enable them to judge fairly as to what was a right and proper thing as between coal purchasers and coal owners as such.

It was to be hoped that there would be some modification of this position. Probably it would not take place in this Session of Parliament, but he was perfectly certain it would have to come about in the next. The Government should appreciate the fact that where great powers were conferred they carried great obligations with them. Those obligations must be laid down definitely. They looked to the Government to lay down definite obligations in the matter of fair treatment and of no discrimination against public utility undertakings. Even when there was an appeal for the voluntary increase of miners' wages it was made with discrimination. In the first letter which was sent out a request was put forward for two shillings from the public utility undertakings, and one shilling from other industries which were better able to pay than the public utility undertakings. That was the first indication of discrimination, and that discrimination must not be allowed to continue. It was a matter of vital importance to the Gas Industry, and he made no apology for introducing it upon that occasion. They had all got to think about it, and they had all got to use every possible influence they could bring to bear upon the matter, so that the man in the street would realize the danger that lay before them; that there might be an attempt to upset the present order of things, and to do damage which might be irreparable to the Gas Industry and also to the electrical industry.

Sales Promotional Tariffs.

He now wished to speak upon more domestic matters. They had been talking, last year, a good deal about co-ordination of sales efforts and the introduction of sales promotional tariffs. Perhaps it might interest them to learn a little about the sales promotional tariffs he had introduced in the Undertaking for which he was responsible at Stretford. They had been introduced in October, 1934, and therefore had now been in operation some 18 months. In the first six months that the two-part tariff was available to ordinary and prepayment consumers only some 8% immediately took advantage of it. The total number of consumers who had transferred to the two-part tariff by March 12, 1936, was 2,024 ordinary consumers, approximately 16% of the total number, and 3,280 prepayment consumers, approximately 22% of the total. The number of consumers on the two-part tariff at the present time, prepayment and ordinary, was 5,304. It would be remembered that the winter of 1934-35, immediately following the publication of the tariff, was a very mild one. Nevertheless, it was very interesting to note that those consumers who had transferred to the two-part some time in June showed an increase over the corresponding previous periods almost without exception. The exceptions were often accountable for by domestic reasons and had nothing to do with the tariff. Of course, the present rigorous winter had caused greater numbers of consumers to adopt it, and the increase had been as much as 200%. There was also another significant factor. It would appear there was going to be a great reduction of gross revenue as the result of the tariff, but, on the contrary, the average revenue from those consumers who had gone on to the tariff would be higher than before the tariff was introduced. The figures for the current year would not be available until after March 31, but from the examination which had been made he was justified in passing the remark that the revenue would be higher. He was arranging to have an actuarial ascertainment of the case of all those consumers who were on the two-part tariff compared with the period before the introduction of the tariff.

He had introduced this subject because he wished to stress the urgent necessity of all undertakers, particularly in view of the coal situation, giving consideration to the desirability of introducing a two-part tariff. He was quite satisfied from his own experience that no pecuniary loss would be entailed. With a reasonable standing charge it would be possible to put into operation a commodity charge which would permit the consumer who wished to use gaseous fuel for his house heating to use it at no greater cost than his total cost of, say, gas for cooking *plus* solid fuel for heating.

He would like also to mention industrial sales. Perhaps in Lancashire they were a little behind other areas in the development of their industrial centre, and he accepted his share of the responsibility for that event. He hoped to be able to devote a little more time to the commonweal in his own district during the present year. During the past year, as President of the Institution his efforts had been

spread over the whole country and in other quarters as well. Nevertheless benefit was being derived in Lancashire through the work that was being done by other centres, and a considerable amount of information had been sent out by Mr. J. H. Sillitoe, of the Manchester Gas Department, to undertakings who had been making enquiries and looking for assistance. Some interesting figures could be stated; because whatever the industrial development centres might do they could not relieve others of the responsibility of doing something for themselves. He considered that the best thing that happened to him as a supplier of gas was the loss of the best consumer he ever had. The Ford Motor Company who were buying 20% of his output shut down their works at Trafford Park and went to Dagenham. It was a most fortunate thing for him although it might seem to be an extraordinary thing to say so. It put the Stretford undertaking on their mettle as to how they could replace that load. In January, 1933, the monthly sales were reduced to 17,725,000 cu.ft. They had been, approximately, as high as 28 million cu.ft. The sales staff was improved and more money spent upon it. More experts were employed on the industrial side. The monthly load was increased in December but it slipped back again in the summer time. In August, 1933, it was 16 million cu.ft. By December it had increased to 23 million cu.ft. per month. By December, 1934, it was back to 25 million cu.ft. In January, 1935, it was 28 million cu.ft., and in December, 1935, it was 44 million cu.ft. per month. It was true that these results were achieved partly by improvement in trade, but they were mainly brought about by sales efforts and by the service which was rendered to manufacturers. Sales efforts must be co-ordinated with the very best service. He was proud of the fact that the majority of the manufacturers in his district came to the Undertaking to-day to ask for assistance in regard to their heating problems. They appreciated that they would be told merely plain fact, and that if they were putting in a plant to which the Undertaking was rendering service, that they could rely upon the best possible assistance. The manufacturer was always given the benefit of any improvement that could be introduced, and everything possible was done to reduce the cost of supply. That was the way to build up confidence.

There was a tremendous field of enterprise in the Gas Industry which was only just beginning to open out. The manufacturer who appreciated the advantages of a clean, easily controlled, fuel like gas, and the effect it had upon the quality of his product and the efficiency of his process, would never go back to any other fuel. After all, it was desirable, from the point of view of everybody, that their coal supply, upon which they were bound to rely in this country, should be made a convenience to everybody so far as its heat units were concerned. That process of education must go on in every town in Great Britain. It was a process of education. The service was available, and the manufacturer must be educated. He must be shown how to use the product that could be placed at his disposal, and also how he could use it in the most economical manner.

South Metropolitan Gas Company's Bill

Therm Meters Authorized

A House of Lords Committee presided over by Lord Cozens-Hardy on March 10 and 11 considered the Bill promoted this Session by the South Metropolitan Gas Company—following a similar Bill which was withdrawn last Session before it came before Parliament in any form except by way of discussion with the authorities—authorizing the use of meters registering therms directly instead of the present type of meter which registers cubic feet after which the conversion to therms has to take place for the purpose of consumers' accounts.

The South Metropolitan Gas Company was represented by Mr. W. E. Tyldesley Jones, K.C., Mr. F. J. Wrottesley, K.C., and the Hon. Henry Hope. There was opposition to the proposals in the Bill with regard to the use of therm meters by the Board of Trade and the London County Council. The former presented its views to the Committee in the usual way through an official who was called by the Committee, while the London County Council was represented by Mr. Jacques Abady, K.C., and Mr. Harold Willis. An appearance was also entered by the West Kent Main Sewerage Board, but this was in respect of a small clause matter relating to a proposed small increase of area. As was pointed out during the proceedings, the opposition of the Board of Trade came from that Department responsible for the administration of the Weights and Measures Acts, and there was no representation from the Gas Administration Department.

Mr. TYLDESLEY JONES, K.C., in putting the proposals in the Bill before the Committee, drew attention to the material part of Clause 5 of the Bill which reads as follows: "Notwithstanding anything contained in Section 2 of the Sale of Gas Act, 1859, the standard or unit of measure for the sale of gas by the Company shall be the therm." He explained to the Committee that in 1923 a therm meter was submitted to the Board of Trade but the Board refused to certify it, the reason given being that it was not thought it would comply with existing legislation with regard to the sale of gas and that it might lend itself to the perpetration of fraud. He then went on to say that last year the South Metropolitan Gas Company promoted a Bill in Parliament for using therm meters and that the only opposition then came from the Board of Trade. The London County Council made no objection and did not put in a petition against that Bill. The Board of Trade, however, was entirely hostile to it then, as now. Eventually, owing to the discussions which took place with regard to the Bill with the authorities of the House, it was found it would be too late for it to come before Parliament in the ordinary way and the Bill was withdrawn. Hence the present Bill.

Now, however, the London County Council came forward with the same objections that the Board of Trade had made last year and were making again this year which, briefly, were that such a change in the legislature should not be the subject of a private Bill but should be dealt with by general legislation applying to the whole country, that it might be possible to perpetrate fraud upon the gas consumers, and that it would be a serious inconvenience to private owners of meters. Moreover, the Board of Trade made the point that the proposal as set out in the Bill was misconceived, as it was difficult to see how a therm could be made a unit of measure in a meter. It was also alleged by the Board of Trade that the number of therms in any quantity of gas supplied could not be ascertained by direct measurement—Counsel said this was not strictly correct—and that it could only be computed from the volume and calorific value of the gas.

Mr. Tyldesley Jones answered this point by saying that this was exactly what the therm meter did. Another objection of the Board of Trade—and, of course, also the London County Council—was that therm meters would have to be set for the calorific value in each particular area so that meters used in one area could not be sent to another area without adjustment, if the calorific value in another area was different. Moreover, said the objectors, every time there was an alteration of calorific value in the South Metropolitan Company's area all the meters would have to be altered. All these disadvantages, said the opponents to the proposal, were to be incurred in order that consumers might see recorded directly on their meters the number of therms for which they were liable. Experience showed, said Mr. Tyldesley Jones, that there was a number of people who took a keener interest in reading their gas meters than seemed to be assumed, and the case for the Bill was that it would generally simplify charging for gas and do away with the need for making laborious calculations as at present.

Dealing with the position in the South Metropolitan Gas Company's areas with regard to numbers of meters, it was pointed out by Mr. Tyldesley Jones that there are at the present time some 440,000 meters of which only 1,289 were privately owned, the remainder being the property of the Gas Company. Thus there was not much in the suggestion that a change to the therm meter would inconvenience the private owners of meters. The case for the Bill, concluded Counsel, was that the use of a meter showing therms would be in keeping with the progress being made in the Gas Industry having regard to the many years' experience of supplying gas on the therm basis, and that it would simplify the position considerably from the point of view of the consumer. During the course of his speech, Mr. Tyldesley Jones handed to the Committee specimens of the dials of the proposed therm meters and explained their operation.

Dr. *Charles Carpenter* (President of the South Metropolitan Gas Company, gave evidence in support of the proposal in the Bill, and in answer to questions said that if all the meters in the Company's area were changed over immediately, it would cost about £300,000, the cost per meter being about 15s. It was proposed, however, to make the change gradually. He also suggested that the therm meter would make it much easier for consumers to check the consumption of their apparatus.

Sir *Charles Vernon Boys*, F.R.S., also spoke in favour of what the South Metropolitan Gas Company proposed to do.

Mr. *John Terrace* (Chairman of the Meters Committee of The Institution of Gas Engineers) spoke of the very few privately owned meters existing throughout the country and expressed the view that in this matter, as in so many others concerned with the Gas Industry, the South Metropolitan Gas Company was doing the pioneer work necessary for progress. It was in

his view a natural development from charging on a therm basis to metering on a therm basis, and the means were available for doing so, subject to the meters being officially certified by the Board of Trade.

The CHAIRMAN asked with regard to the likelihood of a change in calorific value by the South Metropolitan Gas Company.

Mr. *Terrace* replied that it was now very unlikely there would be any further changes—although there had been one or two since the therm was first adopted—unless there was some radical change in gas manufacturing methods or the conditions affecting gas supply. It was as the result of experience that the calorific value was raised to 560 B.Th.U., and there was no reason to assume there would be a change for some time, at any rate. Even so, the meters could easily be readjusted for a new calorific value.

In answer to Mr. JACQUES ABADY, K.C., for the London County Council,

Mr. *Terrace* agreed that no suggestion had come before the Standardization of Meters Committee of The Innstitution of Gas Engineers as to the need for a therm meter generally in the Gas Industry, but he added that this Committee did not concern itself with such a matter.

In the course of further questions, Mr. ABADY made the comment that no such suggestion had been made to the Gas Legislation Committee of 1932, of which he and Mr. Wrottesley, K.C., had had the honour to be members.

Mr. *F. C. Raphael*, an Electrical Engineer, was called to explain the operation of electric meters and said that these did not measure what the consumer was charged—viz., units. The unit charged to the consumer and registered by the meter was the product of other quantities, and in that way the proposed therm meter was identical with the electricity measuring meter.

Mr. *E. V. Evans* (Joint Manager, South Metropolitan Gas Company) confirmed the figures with regard to the number of privately owned meters in the Company's area, and speaking of the cost of changing over to the use of therm meters said the figure of £300,000 which had been mentioned represented the total cost if the meters were changed throughout the district immediately. This work, however, would be spread over a number of years and would be carried out gradually. Normally the Company turned out 20,000 new meters and 30,000 repaired meters a year at a cost of £88,000. Thus if the rate of replacement were 50,000 meters a year, the extra expense would be very small, as the cost of the new dials was only 1s. 6d.

He agreed, in answer to Mr. Abady, that the position would arise that there would be a decreasing number of meters of the present pattern and an increasing number metering the therm if the work was done gradually, as he had suggested.

This closed the case for the promoters and the Chairman asked for the views of the Board of Trade.

Mr. *A. S. Hoskin* (Assistant Secretary to the Board of Trade) said that, while the Board of Trade had nothing to say against the basis of the charge—viz., the therm—one objection to the proposal was on the ground that the underlying principle of the Weights and Measures Acts was that they must apply to the country as a whole. If this Bill were passed it would mean that one system would apply to the area of one gas company and not to the rest of the country. No meter could measure a therm.

The CHAIRMAN remarked that an electricity meter measured ampere-hours, which was not what the consumer paid for, and there had to be a multiplication to give the answer in units. Was not that an exactly parallel departure from the principle of the Weights and Measures Acts—assuming the facts were as he said?

Mr. *Hoskin* then went on to deal with the possibility of fraud if the therm meter was introduced, and said such a meter would facilitate it.

The CHAIRMAN asked if it would be any easier than taking an existing meter and altering the train of wheels.

Mr. *Hoskin* agreed that to do this it would be necessary to break the seal. He said he did not suggest that any gas company would set itself out to defraud its consumers by installing meters set for the wrong calorific value, but there could be circumstances in which servants of the company might be tempted to install inaccurate meters for their own ends.

Mr. JACQUES ABADY, K.C., then addressed the Committee on behalf of the London County Council, and first made the point that it was a principle of private Bill legislation that a special case must be made out before anything in the nature of an alteration of the general law was made in a private Bill. In this case, no attempt had been made by the South Metropolitan Gas Company to prove that the circumstances in their case were special as compared with those of any other gas undertaking, and before the Committee passed any such proposal as that contained in Clause 3 of the Bill it should be satisfied there were special circumstances. He then asked what was the alleged possible advantage to the public by the change and contended that there was none, or certainly not sufficient to justify a change in general legislation such as was proposed in favour of one gas undertaking.

Mr. WROTTESLEY said it was intended under the clause that the Company should have the power to put in a therm meter if it desired and at the same time the consumer should have the right to demand a therm meter if he desired.

Mr. ABADY said he gathered from this that it was possible that certain parts of the Company's area would be served with therm meters and other parts would continue on the old basis, yet the case for the Company was that the existing basis was a wrong one and should be changed. The L.C.C. took the view that, having regard to the exceedingly small advantage which accrued to the consumer, there was no justification for making a change which, on the promoters' evidence, would involve a cost of £300,000.

Without calling on Counsel for the promoters to reply, the Committee deliberated in private.

The CHAIRMAN, when the parties were re-admitted, announced that the Committee had decided the Bill should proceed.

Further Gas Undertakings' Results

Faversham.

The report of the Directors of the Faversham Gas Company stated that there was a slight drop in the sales of gas. This is attributed to the abnormally mild weather in the early part of the year. The income from residuals increased during the year and the total revenue was up—viz., £27,773 against £27,609 in 1934. The balance carried to profit and loss account was £6,445. Dividends were declared of £8% on the original stock and £6 10s.% on the new ordinary stock.

Hexham.

The Hexham Gas Company reports a profit of £2,750 for the year ended Dec. 31, 1935, and a final dividend of £3% on the ordinary stock making £5 10s.% for the year.

Isle of Thanet (Margate).

The Directors' report for the Isle of Thanet Gas Light and Coke Company for the year ended Dec. 31, 1935, states that there has been continued progress and expansion of the Company's business in all departments, the sale of gas having reached 506 million cu.ft., or 2,327,780 therms, which represents an increase of 3% on the previous year. The price of gas was reduced from 7½d. to 7d. per therm and took effect from the reading of the meters for the March quarter, 1935. An interim dividend of 4¾% was paid on Sept. 29 last, and the Directors now recommend a final dividend at the rate of 5%, payable on March 25 next.

Sheppy (South-Eastern).

The Directors' report on the working of the Sheppy Gas Company for the year shows that, after paying in respect of the first half-year dividends at the rate of £4% per annum on the "A" preference shares, £5 5s.% per annum on the consolidated ordinary stock, and £6% per annum on the preference stock, there is a total available balance of £7,321, out of which the Directors recommend the payment of the following dividends in respect of the second half-year—viz.: On the "A" preference shares at the rate of £4% per annum, on the consolidated ordinary stock at the rate of £5 5s.% per annum, and on the preference stock at the rate of £6% per annum, less income-tax in each case, which will absorb the sum of £2,165, leaving £5,156 to be carried forward to the credit of the current year. During the year £31,100 3½% redeemable debenture stock was issued and part of the proceeds used in redeeming £13,920 5% mortgages. The balance has been applied towards capital expenditure on works and mains, and in view of the continued expansion of the Company's business it is proposed that the Directors be empowered to issue the balance of the authorized share and loan capital as this becomes necessary. The sale of gas during the past year shows an increase of 7·7%. There has been an addition for the year to the number of consumers of 424.

Yarmouth.

The report of the Directors of the Great Yarmouth Gas Company for the year ended Dec. 31, 1935, states that after transferring the sum of £800 from the suspense account to the revenue account the gross profit for the year amounts to the sum of £8,573 as against £7,853 last year, when no transfer from suspense account was made. The sales of gas show an increase of 11,317,000 cu.ft., which is equal to 7·72%, and the revenue from sales of gas shows an increase of £1,615—these increases are mainly attributable to the new factory on Caister Road, referred to in last year's report. The return from residuals shows a satisfactory increase of £327. Final dividends for the December half-year, at the maximum rates, are recommended to the shareholders as follows: Original and quarter shares at the rate of 8½% per annum, new £30 shares at the rate of 7½% per annum, and new £10 shares at the rate of 7% per annum, less income-tax, and making with the interim dividends already paid the maximum dividends of the Company for the year of 8½% on the original and quarter shares, 7½% on the new £30 shares, and 7% on the new £10 shares less income-tax in each case.

The Hornsey Gas Company

The Annual Ordinary General Meeting of the Hornsey Gas Company was held at 5, Great Winchester Street, London, E.C. 2, on Friday, March 13, 1936—Mr. G. W. CAREY (Deputy Chairman) presiding, in the absence, through illness, of Mr. A. M. Paddon, M.Inst.C.E. (Chairman of the Company).

Increased Sale of Gas.

The GENERAL MANAGER AND SECRETARY (Mr. K. Leslie Mortimore, A.C.A.) read the notice convening the meeting.

The DEPUTY-CHAIRMAN expressed regret that Mr. Paddon was suffering from laryngitis and had a high temperature, and had been advised that it would be extremely unwise for him to leave his bed.

Moving the adoption of the Report of the Directors and the Statement of Accounts for the year ended Dec. 31, 1935, the Deputy-Chairman drew attention to the fact that the sales of gas in 1935 had exceeded the 1934 figure by 1·5%. In 1934 there had been a decrease of something like 3·5% as compared with 1933; to have turned that into an increase in 1935, therefore, in spite of the fact that the weather had not been very favourable and various other conditions had made things difficult, was a very satisfactory result indeed for such a Company, for its district was practically enclosed, there being no great building activity and no influx of population, so that the increased sales had been made to the existing consumers.

The Report stated that in respect of 1935 it was proposed to add £3,820 to the co-partners' contributory pensions fund, in order to maintain the stability of that Fund.

During the year the Company had issued £50,000 of 4% debenture stock; of that issue, £30,000 had realized 102½% and £20,000 had realized 103½%. There remained unissued £71,330 of capital stock and £90,925 of loan capital, so that there was no fear of the Company becoming short of capital for some time to come.

Referring to a capital account item of £12,842 for lands acquired, the Deputy-Chairman said it represented the price of a very valuable site acquired by the Company, adjacent to the new Town Hall at Hornsey. The plans were practically settled, and it was hoped to begin building shortly a showroom which would be really worthy of the Company and which, it was hoped, would increase the sales of gas. The Company would have very much better facilities than at present for the display of apparatus.

The capital expended during the year amounted to £20,772; but that figure was reduced by depreciation, amounting to £8,638, on gasholders, meters, and leasehold property, so that the net capital increase was only £12,134, and that was practically the value of the land that had been acquired. The capital expended per million cu.ft. of gas sold was £502—a very low figure for a Company of the size of the Hornsey Company.

Referring to items in the revenue account, the Deputy-Chairman said that the expenditure on coals, oil, and coke carbonized (£75,228) represented an increase of £1,766 over the 1934 figure, due, of course, to increased sales of gas. The cost of repairs and maintenance of works and plant had decreased by £370. Repair, maintenance, and renewal of meters (£7,726) showed an increase of £1,122, due not only to increased business but also to the fact that the Company were gradually inspecting the meters throughout the district and making replacements where necessary. Repair, maintenance, and renewal of stoves and fittings (£6,945) showed an increase of £1,735, again due to the large increase of business. The amount charged for bad and doubtful debts (£480) included an additional amount for reserve, bringing the total of that reserve up to a figure of £2,000, which was ample for the requirements of the Company. The total expenditure (£159,406) had increased by £5,284; and the profit (£29,149) had increased by £1,449. The ultimate figure in the revenue account was £188,555, representing an increase of £6,733.

Record Sale of Coke.

Discussing the credit side of the account, he said the revenue from sales of gas to private consumers and for sundry processes and public lighting (£127,059) showed an increase of £3,509; the total receipts for gas and rentals showed an increase of £3,571. With regard to residuals, the revenue from coke (£35,643) represented an increase of £2,861, the total coke figure constituting a record for the Company; and of the revenue from tar and benzole (£8,922), benzole had contributed £3,002 after the deduction of all expenses—a valuable addition to the Company's revenue.

Ordinary consumers in 1935 numbered 14,829, an increase of 332, and the prepayment consumers numbered 10,373, an increase of 369; the increase in the total number of consumers was 701, which was particularly satisfactory, inasmuch as the Company's area of supply was built up already and there was no extension. The number of appliances in use had increased by 4,373, representing an improvement of 46%—another record for the Company. Once the appliances were on the district, sooner or later gas sales would increase, as was the recent experience of the Company. The increased business during the early part of the current year was greater than had been achieved before during a similar period within the Deputy-Chairman's knowledge of the Company, and it was due to the installation of so many appliances. The total increase of gas sales in 1935 as compared with 1934 was 10,955,000 cu.ft., equivalent to 1·5%.

Commenting on the profit and loss account, he said the interest on bank loan, &c. (£1,082), might appear to be rather high, but it included £464 interest at 3½% on the balance standing to the credit of the reserve fund; the Company were paying the reserve fund interest on the sums they were using. The transfer of £3,820 to the co-partners' contributory pensions fund was additional to the Company's ordinary contributions, which were equal to those of the men. The balance to be carried forward from the profit and loss account after the payment of the final dividends (£20,868) represented an increase of £191, and was a safe figure.

The reserve fund amounted to £10,828. It had never been very high, for the reason that in the past there had been a large carry-forward. The carry-forward had recently been reduced, a substantial contribution having been made to the contributory pensions fund; there was not much possibility of adding to the reserve fund at the moment. The Company were paying the maximum dividends they could pay on a gas price of 8d. per therm, which was as low as that of any Company in London. There was one Company, much larger than the Hornsey Company, selling gas in part of their district at 8d. per therm, but that price was well below the selling price of any other companies in London. The reserve fund was very well invested to the extent of £10,661 in high-class Government securities, so that it was a real reserve. There was not the same necessity to invest the special purposes fund, which amounted to £26,322; but £11,655 of it was invested in Government securities.

The sum of £2,470 had been transferred from the revenue account to the renewal fund, representing the maximum amount the Company were allowed to transfer. The total of the fund was £15,662.

The Balance-Sheet.

The balance-sheet showed that the co-partnership fund investment in the stock of the Company amounted to £25,028. That was £454 more than the total standing to the credit of the fund, but the latter amount had been lent to the fund by the Company, because the stock was not always available to be purchased when it was required. The co-partners' contributory pensions fund credit was £43,413, of which £40,163 was invested in trustee securities. On the credit side of the balance-sheet the Company's total investments were shown as £23,816 11s., but a footnote indicated that the value at Dec. 31 last was £34,974—an appreciation of £11,158. An item "hire-purchase—balance of account (less reserve), £38,839" was due to the large number of appliances that were put on to the district on hire-purchase.

At the moment the Company were doing very well indeed.

Mr. FRANK H. JONES, M.Inst.C.E., seconded the resolution for the adoption of the Report and Accounts, which was carried, without discussion.

Dividends.

On the motion of the DEPUTY-CHAIRMAN, seconded by Mr. E. L. BURTON, F.S.A.A., the meeting unanimously resolved:

> "That there be now declared dividends for the half-year ended Dec. 31, 1935 (being the final dividends for the year) as follows:
>
> On the 5% preference stock, £5% per annum;
> On the 5% stock, £7 10s.% per annum; and
> On the 3½% stock, £6% per annum;
>
> all less income-tax (making, with the interim dividends already paid, on the 5% stock and 3½% stock respectively £7 10s.% and £6% for the year); and that such final dividends be paid on Saturday, March 14."

Re-Election of Directors and Auditor.

The DEPUTY-CHAIRMAN moved that the retiring Directors—Mr. A. M. Paddon, M.Inst.C.E., and Mr. E. L. Burton, F.S.A.A.—be re-elected. Mr. Paddon, he said, was an extremely able Chairman; not only did he help the Company enormously, but his name stood very high in the Gas Industry, and the Company were very fortunate in having his services as Chairman. Mr. Burton was also an extremely valuable Director, whose very wide experience of gas accounting was of great service.

Mr. FRANK H. JONES said it was a privilege to second the resolution, first for personal reasons, for both Mr. Paddon and Mr. Burton had been friends of his practically throughout his working life; and secondly, any gas company with which those

two gentlemen were associated was a great success and had been a success for a great many years.

The resolution was carried unanimously.

On the suggestion of the DEPUTY-CHAIRMAN, the meeting instructed the General Manager and Secretary to send a message of sympathy to Mr. Paddon, expressing the hope that he would soon be restored to health.

Mr. BURTON, returning thanks for his re-election, said it was an honour to serve on a Board such as that of the Hornsey Company, for all his colleagues pulled together very happily.

On the motion of Mr. K. R. MACKAY, seconded by Captain H. F. WILKINSON, the meeting re-appointed Mr. Horace A. Floate an Auditor of the Company.

Votes of Thanks.

The DEPUTY-CHAIRMAN moved a hearty vote of thanks to the officers, staff, and workmen of the Company. During the past year, he said, the officers and staff had strained every nerve to sell more gas, and the improved position of the Company was due very largely to their enthusiasm. They were all deserving of the thanks of the proprietors.

Mr. J. W. BUCKLEY, M.Inst.C.E., seconded, and, in the light of his past experience (as Engineer to the Company) of the work of the chief officials, he welcomed the opportunity to endorse the Deputy-Chairman's remarks with regard to them. At the same time, he said, the chief officials were fortunate, as he had been, in having the services of very good subordinate officials. He commented also on the team spirit of the workmen, and said that every department connected with the Company had pulled its weight. Having had the privilege of presiding over every meeting of the co-partnership committee during the past twelve years, he could assure the proprietors that that committee had the interests of the Company very closely at heart; during the whole of those years the members of the committee had never gone to a division on any matter pertaining to the Company and its works.

The vote of thanks was carried with acclamation.

Mr. K. LESLIE MORTIMORE, responding on behalf of the staff, commented on their enthusiasm, and said that although the increased business of the Company had called for considerable excess of work on their part, their response had been excellent. The knowledge of the proprietors' expression of appreciation would spur them on to still further efforts during the coming year.

Mr. C. C. V. GANDON (Engineer and District Superintendent) also responded and paid a tribute to the men working under him on the Company's behalf.

Mr. C. H. RUTTER proposed a very hearty vote of thanks to the Chairman and his co-Directors for the able manner in which they had managed the affairs of the Company during the past year; it was due to them, he said, that the Company's affairs were in so splendid a position. It was a disappointment to all present that Mr. Paddon was not able to attend the meeting; his functions had been ably performed, however, by Mr. Carey.

The resolution was seconded by Mr. K. R. MACKAY, and carried with enthusiasm, the DEPUTY-CHAIRMAN briefly responding.

The meeting then closed.

The Lea Bridge District Gas Company

The Annual Ordinary General Meeting of the Lea Bridge District Gas Company was held at 5, Great Winchester Street, Old Broad Street, London, E.C. 2, on Tuesday, March 10, 1936—Mr. ARTHUR M. PADDON, M.Inst.C.E. (Chairman of Directors), presiding.

The SECRETARY (Mr. Norman H. Davies) read the notice convening the meeting, and the report and accounts were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the report and accounts, said he thought they need not attach very great importance to the first statement in the report, which told them that they had had a slight decrease in the output of gas during the period under review.

The past year had not been remarkable for active development in the Gas Industry; recovery in general commercial conditions had been slow, but perhaps the most encouraging fact was that as from the beginning of the present year there had been a more pronounced advance in the sales of gas—which gave them every encouragement in regard to the remainder of the year.

He had previously mentioned that they had been working under many disabilities—and they certainly had. Many questions had arisen during the past year which would call for very careful and discriminative treatment by gas administrators. One of these was powers of charge. They had not exactly taken the initiative in this matter; their competitors in electricity and other commodities had already established a definite new line of approach to the public in connection with charges, and though they had no reason slavishly to follow their example, the situation did call for very careful treatment as to how far in the future it might be necessary to present a new case to the public in regard to their purchase and use of gas.

They would probably have divined that he had in mind the two-part tariff and other forms of charge. There were two ways of dealing with such matters—namely, either by arbitrary enforcement of the principle or by discretionary application. In his own view, circumstances would justify the latter rather than the former method. In the north two-part tariffs had been applied generally and comprehensively to the public, and in certain circumstances these had had a measure of success. But, just as in the supply of electricity, circumstances differed all through the country in two or three essential respects. For instance, the proportion of industrial and domestic users of gas in different areas rendered it impossible rigorously to adapt the conditions to a new form of charge, but as an alternative to a discretionary measure gas undertakings would have to consider adopting a method of charge in relation to the requirements of their consumers, and if they failed to do so they would, to a certain extent, play into the hands of their competitors and fail to retain business, let alone extend it.

A Large Industrial Load.

A feature of the Lea Bridge Company was the large industrial load in connection with the supply of gas, and that was likely to increase by reason of present-day developments to a degree which was of ever-growing importance; and he thought that in dealing with the difference between industrial and domestic supply all the circumstances must be fully taken into account. Those taking gas for industrial use did expect a very material difference in price; otherwise they would have no inducement to adopt this method. There had been a reluctance to recognize this fact because the discernible profit had not been larger. It had been assumed that such procedure was to the detriment of other consumers; but that was not necessarily the case.

If the superficial characteristics of the industrial load were examined it would be appreciated that it was a stable supply going on from day to day. It was more or less even, whereas the demands of domestic consumers owing to changes in climatic conditions were often abnormally increased, and plant had to be provided to meet such demands.

The industrial load tended to even up the output throughout the year. Many undertakings regulated their dispositions by the amount of gas sold on Sundays in the middle of the day. Anything that would accentuate that demand meant a very disadvantageous exaction on the undertaking's expenditure. The industrial load did not take supplies on Sundays but was an even load throughout the week.

Supposing that 15 million cu.ft. of gas was being sold for industrial purposes one could appreciate how many domestic supplies would be necessary to aggregate that output. Each domestic supply required individual attention—separate mains, separate services, separate meters—but in the case of industrial users, taking very large quantities of gas, many of the items which go to make up overhead charges are dispensed with.

Therefore it was not a disability that a very large proportion of their business consisted in supplying the industrial load.

There were certain other peculiarities; they had a large percentage of prepayment consumers, and prepayment consumers were not a particularly stable kind. They could be tempted by the less meritorious attractions of electricity—until they came to paying for it. This meant discriminative treatment for their prepayment consumers. So there was no cut and dried policy which would control the interests of the Company. There was need for a great deal of special discrimination and care in meeting circumstances under which they carried on their business if they were to be as successful in the future as they had been in the past.

There was another field in bringing the use, convenience, amenities, and economy of gas more to the notice of the public than in the past. This meant enlargement of staff and extension of effort, and so far as they had gone the response to this special treatment had been very satisfactory indeed. By this means they were hoping not only to maintain but to extend their business in Leyton and Walthamstow in circumstances which many other undertakings were not called upon to face.

The Accounts.

Turning to the accounts, the Chairman observed that they were temporarily provided with all the capital powers they

needed. In regard to the use of capital, they had spent during the year £16,893, which had been reduced by depreciation by approximately 50% to £8,750. They had, unfortunately, recorded no increase in the sales of gas to set against this, with the result that the amount of capital employed in their business per million cu.ft. had risen to £511; but he knew of at least a dozen undertakings who would be very glad to exchange that figure for theirs.

In regard to the revenue account, on the credit side they had lost £2,150 in connection with the reduced sales of gas and the hire of meters and fittings; but this was not so bad as it appeared by reason of the fact that it was largely due to the additional discounts necessary to furthering their business. Residuals had increased by £3,230, and he thought that this favourable atmosphere might be trusted to continue during the current twelve months. The unaccounted-for gas figure, which included that used in showrooms and works, was not high at 6%. The sales of gas had been over a thousand million cu.ft. for the year.

On the other side of the revenue account there had been a saving on coal and coke of about £1,000, while repair and maintenance of works and plant showed a saving of some £4,000. Repair and maintenance of stoves and fittings had increased due to the fact that they had had to face the demand for modern appliances such as enamelled cookers in the place of black ones, which the public were so insistently, and in his view unintelligently, discarding. But they must respond to this demand. They had done a great deal during the year under review, and in another year they might almost expect to have surmounted the necessary charges in this respect.

They had contributed £2,000 to renewal fund as a part of their trading costs, and they would see a rather handsome figure of £1,646 contributed to the co-partners' contributory pensions fund. This was a normal contribution; and if they referred to the profit and loss account it would be seen that they were making a special contribution of £2,000 to this fund in order that they might establish its stability at the earliest date.

The epitome of the revenue account was that they had received £1,077 more, while they had spent £646 more—so that they had made £431 more profit.

It would be seen from the profit and loss account that they had brought in £22,335 and had taken out £161 more. The reserve and special purposes funds continued their important duties of supporting the general account, and a large proportion of these funds were invested. A new account was the renewal fund, which consisted of the provision they had made in the past in connection with the renewal of their vertical retorts, and the £2,000 to which he had referred had been transferred to this account to meet any inequalities in the charges for the maintenance of their works.

The Balance-Sheet.

In the balance-sheet the investments on account of reserve and special purposes funds, which stood at a book value of £82,752, had a market value of £113,686. Of the amount spent on reconditioning of stoves £13,000 had been carried forward, as this could not be regarded as a charge specially applicable to any particular period of accounts. The position of co-partnership in the Company was every bit as satisfactory as the financial aspect. This was especially beneficial not only to the workers but to the administration, and in the long run to the shareholders. Their position would be vastly more precarious if they were deprived of the advantages of co-partnership.

The CHAIRMAN then formally moved the resolution for the adoption of the report and accounts, which was seconded by the DEPUTY-CHAIRMAN (Mr. G. W. Carey), and, there being no response to the Chairman's invitation to shareholders to comment on the report, it was put to the meeting and carried unanimously.

Dividends.

The CHAIRMAN thereafter moved the declaration of dividends for the half-year ended Dec. 31, 1935, at the following rates:

4% per annum on the 4% preference stock
5% ,, ,, 5% ,,
6% ,, ,, 6% ,,
8½% ,, ,, consolidated ordinary stock

(all less income-tax), payable on Friday, March 13, 1936.

This was seconded by Mr. E. L. BURTON, F.S.A.A., and carried unanimously.

Re-Election of Director and Auditor.

The CHAIRMAN then moved the re-election of Mr. Stanley Hunter Jones, M.Inst.C.E., being the Director retiring by rotation. He was sure they would all regret Mr. Jones' absence that day and the illness which occasioned it. They had heard, however, that he was making good progress, and they hoped it would soon be possible for them again to have the benefit of his help and experience on the Board and his great conversancy with the Gas Industry.

Mr. H. HAND seconded this resolution, and it was carried unanimously.

On the proposition of Mr. E. A. PIERCE, seconded by Mr. A. W. OKE, the retiring Auditor, Mr. Hyde C. Burton, F.C.A., was re-appointed.

Vote of Thanks.

The CHAIRMAN said that he hoped they would allow him to send a vote of thanks to the executive officers, staff, and workpeople of the Company. It was quite unnecessary for him to go over the ground again in order to say why this vote was merited; but it would be valued by the recipients and would be missed if they did not send it. The whole account which it had been his duty and pleasure to put before them that afternoon was justification for expressing appreciation of their efforts which had produced those results. Their officers had given full and ample service and the respective staffs under them, all of whom had responded in the greatest possible measure and had contributed to the generally satisfactory results which it had been his duty to put before them. He therefore moved a very hearty vote of thanks to the officers, staff, and workpeople for their services.

Mr. HAND said that knowing something of the conditions within the Company he was, perhaps, in a better position than most to support this vote of thanks. He appreciated the onerous duties of the Engineer and also those of the Secretary and their staffs who he always found assisted them in every possible way. He was glad to hear that they were doing so still and had very much pleasure in seconding this vote.

Mr. D. C. CROSS (Engineer and General Manager), in responding to the vote on behalf of the staff and employees, remarked that they were very gratified at this vote of thanks; they did their best, and they very much appreciated this expression of appreciation. All departments were working together splendidly for the advancement of the Company, and they did appreciate the help which the Board gave them. They thanked them very much for the vote of thanks.

Mr. NORMAN H. DAVIES also acknowledged the vote on behalf of the secretarial staff and heartily endorsed all that Mr. Cross had said.

Mr. E. A. PIERCE finally proposed a vote of thanks to the Chairman for presiding over the meeting, and he thanked him and his co-Directors for what they had done during the year.

Mr. A. W. OKE, in seconding, remarked that they always looked forward to hearing the Chairman's very lucid statement, and they went away feeling that they knew something more than before. They had watched the progress of this Company for many years, and he looked upon it as one of the soundest companies in the Gas Industry; one felt that it was being managed by a set of experts; the consumers were well looked after and the interests of their employees were safeguarded on retirement by the pension scheme.

The vote of thanks was carried unanimously, and the CHAIRMAN, in acknowledgment, said that while they could they would continue to serve them in every possible way and promote the interests of the Company to the best of their ability.

The proceedings then terminated.

Brighton, Hove, and Worthing Gas

Record Sales of Apparatus

The annual ordinary general meeting of Brighton, Hove, and Worthing Gas Company was held on Friday, March 13, at 5, Great Winchester Street, E.C.

Mr. G. W. CAREY (Deputy-Chairman), who presided in the absence, through illness, of Mr. A. M. Paddon, the Chairman, said that the accounts included 12 months' returns from the Littlehampton undertaking, against five months' in the year before. The sales of gas showed a small decrease—under 1%—but in the Littlehampton area there had been an increase of 19·7%, which was satisfactory, and justified the acquisition of that Company. He would say no more with regard to the attitude of the Brighton Corporation than was contained in the report, except to hope that the time would come when the Company would be on better terms with the Corporation. The sales of gas apparatus last year constituted a record for the Company, at £92,344, and the number of appliances put out on the district showed an increase of 11,417. After charging £10,000 to Special Purposes Fund, £11,000 to Pensions Fund, and writing off part of the cost of the Littlehampton undertaking, there was an available balance of £133,000.

It would be seen on the debit side of the capital account that new buildings and plant amounted to £29,972. That included the balance of the Littlehampton trunk main, the reconstructed holder at Black Rock, which was very valuable to them, and various alterations to mains and works, and that together came to £69,185. Against that they had depreciation to write off amounting to £23,676, so that their total capital expenditure during the year was £45,509. They had redeemed £94,380 of 7% redeemable debenture stock and £17,500 of 5½% redeemable mortgages during the year, so that they expended most of their £50,000 in that way.

With regard to the 1s. per ton added to the cost of their coal to meet an increase in miners' wages, this would mean an additional expenditure of about £9,000, but the Board did not consider it advisable to raise the price of gas. Residuals last year brought in £10,500 more, and that was one way in which they might recoup themselves. The investments of the Reserve, Special Purposes, and Renewal Fund totalled £212,204, and their value at Dec. 31 was £285,403.

They had started the new year well, and if the temperature was favourable to them he hoped they might sell a substantially increased amount of gas.

The report and accounts were unanimously adopted.

Further Gas Undertakings' Results

Dublin.

The report of the Directors of the Alliance and Dublin Consumers' Gas Company for the half-year ended Dec. 31 states that the accounts show a profit on the revenue account of £80,493 and, after providing for interest on debenture stock, interest on temporary loans, and income-tax, there remains the sum of £67,942, to which must be added the sum of £40,437, being the balance brought from the last account, making a total of £108,378. The Directors recommend the declaration of a dividend, on the £1,551,868 consolidated ordinary stock of the Company which existed prior to the recent new issue, at the rate of £7 12s. 6d.% per annum (this being the maximum statutory dividend permissible under the sliding scale provisions when gas is sold at the rate obtaining during the half-year concerned), less income-tax, which will absorb the sum of £59,165, after which a balance of £49,213 will remain to be carried to the next account. The Directors further report that in pursuance of the powers contained in Section 17 of the Alliance and Dublin Gas Act, 1909, and of the resolution of the extraordinary meeting of the Company on March 28, 1935, £215,571 consolidated ordinary stock was sold by tender and that the premiums obtained on the sale thereof amounted to £84,429, the total amount realized being £300,000, this being the full amount authorized by the Act. In accordance with the terms of issue, no dividend is payable on the £215,571 stock in respect of the half-year ended Dec. 31 last, but this stock will hereafter rank for dividend in the ordinary course.

Maryborough (Queensland).

The half-yearly report of the Directors of Maryborough (Queensland) Gas and Coke Company, Ltd., for the half-year ended Dec. 31, 1935, states that there has been an increase in gas sales as compared with the corresponding period of 1934. The monetary value is, however, considerably less than 1934, which is accounted for by the amount of gas used on the works being calculated at the recent reduced gas rate instead of the previous higher rate. This was done to conform with the Gas Act Regulations, but the amount so charged is purely a book entry, and does not affect the profits in any way. Residual products show a decrease, due to the previous stock of tar on hand being disposed of in the early part of 1935. Expenditure is slightly less than 1934. The sum of £259 was transferred from reserve fund to credit of profit and loss account, to provide for balance of cost of new retort settings. After writing off £500 for depreciation, and making provision for all other charges, the profits amount to £1,283. To this amount has to be added £75 brought forward from last half-year, making the total amount at credit of profit and loss account £1,358. The Directors recommend payment of a dividend of 5% per annum, amounting to £1,031, leaving a balance to be carried forward, to provide for taxation, of £326.

Minehead.

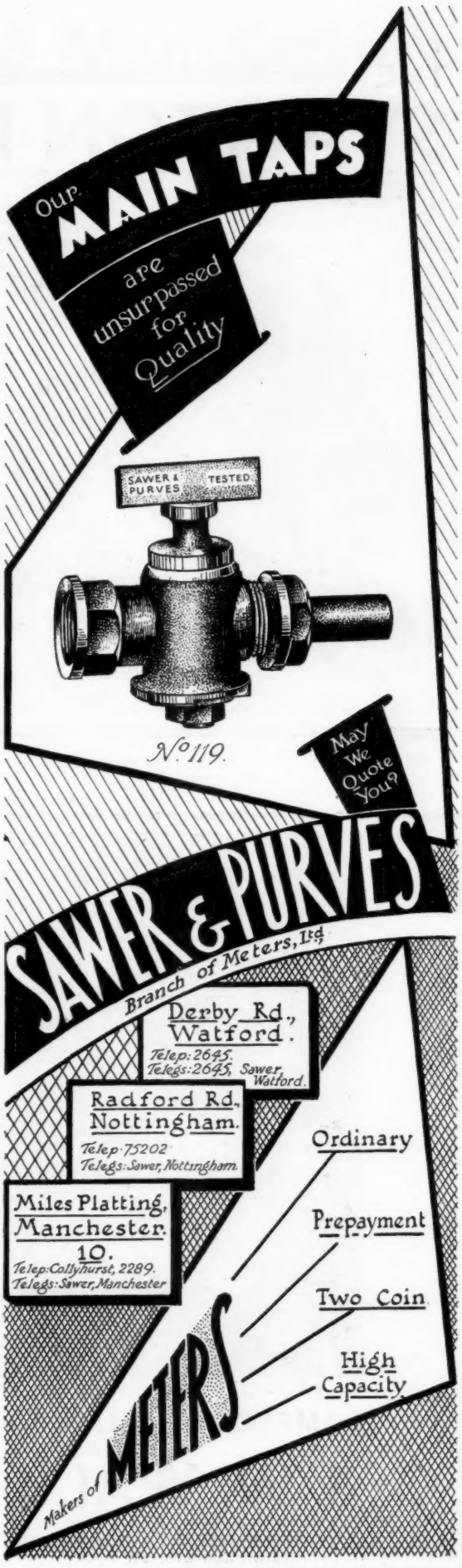
The report of the Directors of the Minehead Gas-Light and Coke Company for the year ended Dec. 31, 1935, states that the balance of net profit for the year is £4,566, which, added to the amount brought forward from the last account, £1,266, makes a total of £5,832. After deducting income-tax, £689, and debenture interest of £541, and carrying £250 to leasehold depreciation fund account, there remains a balance available for distribution of £4,351. The Directors therefore recommend the declaration of a dividend of 8%, less income-tax, on both the £5 and £1 shares, which absorbs £2,914, leaving a balance to carry forward of £1,437. In spite of the abnormally hot and dry summer, and a continuance of scrapping of old cookers which were replaced by modern cookers, the sale of gas at 57,729,300 cu.ft. shows an increase of 1,468,600 cu.ft., equal to 2·6%.

St. Austell.

The report of the Directors of the St. Austell Gas Company for the year ended Dec. 31, 1935, states that there has been an increase in the sales of gas of nearly 3½ million cu.ft. for the year, while the revenue from gas sales increased by £770. During the year the £4,000 6% debentures were redeemed. These were replaced by a temporary loan at a lower rate of interest. The amount standing to the credit of profit and loss account after paying an interim dividend of £320 amounts to £1,285, which the Directors recommend should be appropriated as follows: Final dividend at the rate of 5½% on the old shares (making 8½% for the year), £495, final dividend at the rate of 4% on the new shares (making 7% for the year), £190, less income-tax at 4s. 6d. in the £, £154, carrying to reserve fund £200, and carrying forward to next account £555.

Windsor.

The Directors' report for the year ended Dec. 31, 1935, to the shareholders of the Windsor Royal Gaslight Company states that interim dividends were paid at the basic rates in September last, and after providing for interest and other charges there remains a balance of £8,781 available for dividends. The Directors recommend the payment of a final dividend of £2 10s.% on the "P" shares, £6 10s.% on the "O" shares, and £4 11s.% on the "N" shares, making total dividends for the year of £5%, £11 10s.%, and £8 1s.% respectively. This will absorb the sum of £3,304 and leave a balance of £5,477 to be carried forward. Although the very mild weather throughout the year has resulted in a small reduction in the quantity of gas sold, the Company has been extremely busy in its fitting department, while the demand for cookers, fires, and hot water apparatus continues to be most gratifying and augurs well for the future.



THE

STANTON MECHANICAL LEAD JOINT

NO INCREASE IN COST OF PIPELINE

The troublesome operations of lead melting, running and caulking are dispensed with in this new lead joint. To make the joint, a *pre-cast* lead ring is slipped over the pipe spigot, two half-collars are placed in position, and the operation is completed by tightening four high-grade, cast-iron setscrews with an ordinary spanner.

The lead ring is positively held in position by the half-collars, and cannot be dislodged. A steel spring insertion ring, cast inside the lead, serves to distribute the end pressure so that the lead makes effective contact throughout its full depth.

Patent Nos. 404955 and 433137

THE STANTON IRONWORKS COMPANY LIMITED, Near NOTTINGHAM

SIX PURIFIERS, EACH 50 FT. × 30 FT. × 8 FT., ERECTED AT STOKE-ON-TRENT.

COMPLETE **PURIFIER** INSTALLATIONS.

WITH BOXES IN C.I. OR STEEL

C & W. WALKER, LTD. DONNINGTON, NR. WELLINGTON—SHROPS.

'Phone: Lilleshall-Shropshire Nos. 34 & 35 (2 lines) 'Grams: "Fortress," Donnington, Shropshire

LONDON OFFICE: 70, VICTORIA STREET, WESTMINSTER, S.W. 1.

'Phone: Victoria No. 1941 'Grams: "Fortress," Sowest, London

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

Markets have spent a week under the cloud of the gravest political crisis since 1914. A large amount of liquidation was in evidence with the consequent lowering of prices, though a considerable proportion of the latter was due to the precautionary measures taken by jobbers in their efforts to guard against losses. So far as affairs at home are concerned, however, conditions remain favourable, and it is evident that markets need only the slightest sign of an early settlement of the situation for values to make a speedy recovery.

The Gas Market came through the week very well, and with very few exceptions prices remained steady. On the London Exchange the only serious setback occurred in the stock of a concern operating abroad—viz., the Imperial Continental, which dropped 10½ points to 165, though towards the close the price showed signs of hardening again. Gas Light units were quoted a shade lower at 27s. 9d., while Commercial at 101½ and South Metropolitan at 123½ both fell 2 points on the week. Uxbridge ordinary registered the only small gain on the London Gas Market and closed 1 point higher at 155½. In the Supplementary List the two capital stocks of the Oxford Company, after strengthening the previous week, were both marked down 10 points, the ordinary stock dropped to 210 though business was recorded at 217-219 a week ago, and the 5% preference fell to 110½. In the Provincial Lists the only movement was in Sheffield consolidated with a gain of 2 to 145½. At this price the yield on a 6% basis works out at £4 2s. 6d.%, and having regard to the Company's progress (the sales of gas increased by over 16% last year) and strong financial stability, a purchase at or about this price should constitute a useful permanent investment.

Current Sales of Gas Products

The London Market for Tar Products.

March 16.

There are a few changes to report in the tar products market, prices being as follows:—

Pitch, about 42s. 6d. per ton f.o.b.
Creosote, 5⅛d. per gallon.
Refined tar, 3⅜d. per gallon in bulk at makers' works.
Pure toluole, about 2s. 8d.
Pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 8d.; and 90/160 pyridine, about 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

March 16.

The average prices of gas-works products during the week were: Gas-works tar, 24s. 3d. to 29s. 3d. Pitch—East Coast, 42s. 6d. to 45s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 42s. 6d. to 45s.* Toluole, naked, North, 2s. 2d. to 2s. 4d. Coal-tar crude naphtha, in bulk, North, 8d. to 8½d. Solvent naphtha, naked, North, 1s. 6d. to 1s. 6½d. Heavy naphtha, North, 1s. to 1s. 1d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅜d. to 4⅞d.; low gravity, 4⅜d. to 4⅝d. Heavy oils, in bulk, North, 4¾d. to 5d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £19 to £21. Salts, 95s. to 100s., bags included. Anthracene "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *March* 14.

There is continued activity in most products and values are firm with the tendency towards higher levels.

Crude gas-works tar.—The actual value is 32s. to 33s. per ton *ex* works in bulk.

Pitch is dull at 35s. to 37s. 6d. per ton f.o.b. Glasgow for export, and 35s. per ton *ex* works in bulk for home trade.

Refined tar.—Enquiry is more plentiful and quotations are steady at 2⅞d. to 3d. per gallon, f.o.r. makers' works naked.

Creosote oil remains unchanged on the week's trading. B.E.S.A. Specification, 5¼d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5¼d. to 5½d. per gallon; all f.o.r. in bulk.

Cresylic acid.—Demand continues strong and to-day's prices are approximately as follows: Pale, 97/99%, 1s. 6d. to 1s. 6½d. per gallon; dark, 97/99%, 1s. 4d. to 1s. 4½d. per gallon; and pale, 99/100%, 1s. 9d. to 1s. 10d. per gallon; all *ex* works naked.

Crude naphtha remains quietly steady at 5¼d. to 5⅜d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 4½d. to 1s. 5½d. per gallon, and 90/190 heavy naphtha is 1s. to 1s. 1d. per gallon.

Motor benzole continues to be offered in small quantities at 1s. 3½d. to 1s. 4d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. to 5s. 6d. per gallon, and 90/140 grade is 5s. 6d. to 6s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole . . .	0	8½	to	0	9	per gallon at works
Motor ,, . . .	1	2	,,	1	2½	,, ,, ,,
90% ,, . . .	1	3	,,	1	3½	,, ,, ,,
Pure ,, . . .	1	7	,,	1	7½	,, ,, ,,

Contracts Advertised To-Day

Coal.
Chelmsford Gas Department. [p. 784.]
Naphtha (Crude).
Lincoln Gas Department. [p. 784.]
Purifier Repairs.
Skipton Gas Department. [p. 784.]
Retorts.
Goole Gas Department. [p. 784.]

Trade Notes

"Tully" Plant for St. Andrews.

The St. Andrews Gas Company, Ltd., have placed an order with Tully, Sons, & Co., Ltd., for a duplicate coal gasification plant of 150,000 cu.ft. per day capacity for their Anstruther Works.

West's Gas Improvement Co., Ltd., Danish Order.

We are informed by the Danish-British Association that the Municipality of Svendborg (Denmark) is rebuilding its gas-works, for which rails, tip-carts, and various other materials are needed. An order for just over 100,000 Kr. (approximately £4,475) has been placed with West's Gas Improvement Company, Ltd., of Manchester.

Brayshaw Products.

From Brayshaw Furnaces and Tools, Ltd., we have received copies of their new Furnace Department and Cutter Department Bulletins for the current year, giving an indication of the range of the firm's manufactures and illustrating typical examples of their latest products. In the Furnace Department Bulletin is illustrated an incinerator furnace for cookers. This is one of the two such furnaces which the firm have supplied to a number of gas undertakings. Treatment in the furnace burns away grease, dirt, and old enamel from the cookers, and by this process a particularly good surface may be obtained for re-enamelling. The firm have in course of preparation a new brochure on the "Use of Fusible Salts in Heat Treatment."

A New Portable "Dead Beat" Recorder.

By the introduction of their new pattern of the Simmance patent "Dead Beat" recorder—styled the "Saxon"—Alexander Wright & Co., Ltd., claim to meet a need for a portable instrument that will better stand up to hard usage. The new model has a robustly-made metal case, stove-enamelled, which will withstand the hard knocks to which such instruments are often subject while being taken from place to place. This recorder can be supplied for setting up in an office or showroom, if desired, and for such purpose the finish can be selected to harmonize with existing furnishings. The mechanism includes an 8-day clock movement to rotate the chart disc once in 24 hours, or, alternatively, once in 7 days.

"Sight-Light" Meter.

In view of the number of enquiries that have been received by the International General Electric Company of New York, Ltd., Crown House, Aldwych, W.C. 2, regarding the "Sight-Light" indicator described in our columns last week, these further details will be of interest to our readers. The "Sight-Light" indicator is manufactured by the Sight Light Corporation, of New York, and the International General Electric Company have the selling rights for this instrument outside U.S.A. and Canada. In addition, the General Electric Company, U.S.A., the parent Company of the International General Electric Company, now manufacture a Light Meter which is 2½ in. square and 1⅛ in. thick. The sensitive element is situated on the top of the instrument, and as one naturally assumes such a position in reading the scale that the possibility of having incident light intercepted by the head or shoulder of the individual taking the reading is reduced to a minimum and error thereby avoided. The scale ranges 0-75 foot-candles. The Metropolitan-Vickers Company, of Trafford Park, Manchester, expect to produce an instrument similar to the General Electric Light Meter in the very near future.

Get the most out of every class of coal in every size of works by adopting

THE WEST SYSTEMS

- GLOVER-WEST VERTICAL RETORTS
- WESTVERTICAL CARBONIZING CHAMBERS
- COAL AND COKE-HANDLING & PREPARATION

Orders for Glover-West vertical retort installations have been received during the present year from the Dudley, Brierley Hill & District Gas Company (3rd order), the Kelso Gas Company, Ltd., the Altrincham Gas Company (3rd order), the Bilston Gas, Light & Coke Company (2nd order), and the Grangemouth Corporation Gas Department (2nd order).

- Carbonizing plants have been recently put into commission at Stratford-on-Avon, Buxton, Kilsyth, Montrose (2nd order), Manchester (6th order), Slough, Johannesburg (2nd order), St. Helens (4th order), St. Albans and Willenhall.

THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MANCHESTER: Albion Ironworks, Miles Platting — 'Phone: COLLYHURST 2961 : 'Grams: "STOKER, MANCHESTER"

LONDON: Columbia House, Aldwych, W.C. 2 — 'Phone: HOLBORN 4108 : 'Grams: "WESGASCO, ESTRAND, LONDON"

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mar. 13	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Sept. 9	7	7	Alliance & Dublin Ord. ...	145—155	...	...
374,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	164—169	...	...
300,000	1	Oct. 7	1·9⅓	1/4⅓	Bombay, Ltd.	1⅛—1⅜	...	...
179,305	Stk.	Mar. 2	9⅓	9⅓	Bournemouth sliding scale ...	218—228*	...	...
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	169—174*	...	...
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153*	...	...
50,000	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 17	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	153—158	...	...
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	...
855,000	,,	Mar. 2	7	8	British Ord.	158—163*	...	158—161
100,000	,,	Dec. 16	7	7	Do. 7 p.c. Pref.	153—158	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—101	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	107—112	...	...
200,000	,,	,,	17/6§	3½	Do. 3½ p.c. Red. Deb. ...	98—100	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Jan. 6	4½	4½	Do. 4½ p.c. Deb. ...	81—86	...	...
626,860	,,	Feb. 3	6	6	Cardiff Con. Ord.	131—136	...	...
98,936	1	Sept. 23	2/-	2/-	Colombo, Ltd., Ord.... ...	1⅛—1⅛	...	...
24,500	1	,,	1/4⅛	1/4⅛	Do. 7 p.c. Pref. ...	20/—22/-	...	...
609,204	1	Oct. 7	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	19 6—21 6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	23/6—25/6	...	...
1,775,005	Stk.	Feb, 3	5	5	Commercial Ord.	99—102	−2	100—101
620,000	,,	Dec. 2	3	3	Do. 3 p.c. Deb. ...	85—90	...	85—87
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	119—124	...	...
807,560	,,	,,	7	7	Croydon sliding scale ...	157—162	...	159
644,590	,,	,,	5	5	Do. max. div.	113—118	...	116—117½
620,385	,,	Dec. 16	5	5	Do. 5 p.c. Deb.... ...	121—126	...	...
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c.... ...	107—110	...	...
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c. ...	130—135	...	...
176,211	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	122—127	...	...
19,284,128	,,	Feb. 3	5⅞	5⅞	Gas Light & Coke 4 p.c. Ord.	27 3—28 3a	−3/3	27/6—28 1½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.... ...	89—92	...	91—91½
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	107—110	...	107⅝—109¾
8,602,497	,,	Dec. 2	3	3	Do. 3 p.c. Con. Deb. ...	89—92	−2	90—92
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	117—120	...	119⅛
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	114—117	...	114½—115½
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
140,000	1	Sept. 23	1/7⅛	1/7⅛	Hongkong & China, Ltd. ...	1⅛—1⅛	...	...
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140*	...	...
5,600,000	,,	Nov. 4	14	8	Imperial Continental Cap. ...	160—170	−10½	163—171
223,130	,,	Jan. 20	3⅛	3⅛	Do. 3⅛ p.c. Red. Debs.	92—97	...	94½—95½
285,242	,,	Feb. 17	8⅛	8⅛	Lea Bridge 5 p.c. Ord. ...	172—177	...	...
165,736	,,	Aug. 26	10	8	Maidstone 5 p.c. Cap. ...	182—192	...	187
63,480	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	Dec. 2	†10	†10	Malta & Mediterranean ...	200—210	...	...
392,000	—	Oct. 1	5⅛	5⅛	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	Jan. 2	3⅛	3⅛	Do. 3⅛ p.c. Rd. Rg. Bds.	96—99	...	...
675,000	Stk.	Nov. 18	†3	†3	Montevideo, Ltd.	60—65	...	...
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	169—174	...	...
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	108—113	...	...
300,000	,,	Nov. 4	†7	†9	Oriental, Ltd....	167—172	...	...
416,617	,,	Dec. 16	8	8	Plymouth & Stonehouse 5 p.c.	166—171	...	...
504,416	,,	Feb. 3	8⅛	8⅛	Portsm'th Con. Stk. 4 p.c. Std.	170—175	...	172
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113	...	...
114,000	,,	Feb. 3	5	5	Preston 5 p.c. Pref. ...	110—115	...	...
321,961	1	Sept. 23	...	1/-	Severn Val. Gas Cor. Ld. Ord.	22/—23/-	...	22/7½
319,510	1	,,	...	-/10⅞	,, ,, 4½ p.c. Cum. Pref.	21/9—22/9	...	22/6
133,201	Stk.	Feb. 17	8⅛	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	150⅛
90,000	10	May 27	†3⅛	†3⅛	South African... ...	3—4	...	...
1,061,779	1	Sept. 23	1/2⅞	1/2⅞	South East'n Gas Cn. Ld. Ord.	27/6—28/6	...	27/10⅛
845,016	1	,,	-/10⅛	-/10⅛	Do. 4½ p.c. Red. Cum. Pref.	22/3—23/3	...	...
200,000	1	,,	...	4	Do. 4 p.c. Cum. Pref. ...	21/—22/-	...	21/3
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red. Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6½	South Met. Ord.	121—126	−2	121—124
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	147—152	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	103—107	...	105½
1,895,445	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	88—91	...	91
1,000,000	,,	Jan. 6	5	5	Do. 5 p.c. Red. Deb.	114—117	...	114
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	130—135	...	130—133½
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	123—124
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	...
888,587	,,	Dec. 16	5	5	Do. 5 p.c. Deb....	123—128	...	126
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	104—109	...	108
415,907	,,	Dec. 2	...	4	S. Western Gas & Water Ord.	23/—24/-	...	...
160,523	,,	Oct. 21	...	...	Do. 4½% Red. Cum. Pref.	22/—23/-	...	...
110,000	,,	Dec. 16	4	4	Do. 4% Red. Deb. ...	98—103	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord. 5 p.c. max.	113—118	...	...
121,275	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—103	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	...
106,000	,,	Dec. 16	6½	6½	Do. 6½ p.c. Red. Deb. ...	96—101	...	...
94,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	96—101	...	...
1,076,490	,,	Feb. 17	6½	6½	Tottenham and District Ord.	149—154	...	152½—152½
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref....	130—135	...	...
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
371,850	,,	Dec. 2	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	153—158	+1	157½
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	£126 3 0
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	158—163	...	158—162½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	123—125
1,317,964	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
499,735	,,	Feb. 17	6½	7½	Watford and St. Albans Ord.	155—160	...	...
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	...	3½	Do. 3½ p.c. Red. Deb.	96—101	...	...
158,400	,,	Mar. 2	5	6b	Winchester W. & G. 5 p.c. Con.	112—117*	...	...

a.—The quotation is per £1 of Stock. b.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year. § Actual for three months.

Stock and Share List continued overleaf.

Service

The value of your Sales and Service men is gauged by the knowledge they possess of matters pertaining to the Industry they serve. The more knowledge they possess the greater the assistance they can be towards building up an efficient and successful organization.

At little cost, the "GAS SALESMAN" (published monthly) offers a ready means to this end. As the only separate publication devoted exclusively to the sales and service side of the Industry, it has an individuality of its own and keeps its readers abreast of the times.

Do all your sales and service men regularly receive a copy of each month's issue?

Specimen copies will gladly be supplied on request.

The annual subscription is 6s.

All communications to Walter King, Limited, The "GAS SALESMAN" Offices, 11, Bolt Court, Fleet Street, London, E.C. 4.

STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. Mar. 13.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 3	5	6	Bath Cons.	124—126	...	...
1,667,250	,,	Feb. 17	5	5	Bristol, 5 p.c. max.	119—121	...	...
120,420	,,	Dec. 16	4	4	Do. 1st 4 p.c. Deb. ...	102—104	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	102—104	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	125—128	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max....	111—116	...	...
13,200	12	Aug. 26	8⅓	7	Pontyp'l Gas & W. 10 p.c. 'A.'	14½—15½	...	...
13,600	10	,,	6	5	Do. 7 p.c. 'B.'	11½—12½	...	...
40,000	10	,,	6	5	Do. 7 p.c. 'C.'	11½—12½	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—100	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	165—169	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb. 3	5	6½	Chester 5 p.c. Ord.	107½—112½	...	...
92,500	,,	Dec. 16	4	4	Do. 4 p.c. Pref.	100—105	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	91—96	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	100—105	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	133—135	...	134½
245,500	,,	Dec. 16	5	5	Do. 5 p.c. Red. Pref. ...	103—108	...	...
306,083	,,	Jan. 6	4	4	Do. 4 p.c. Deb. ...	105—107	...	...
106,280	,,	Feb. 3	10	10	Preston 'A' 10 p.c. ...	202—212	...	...
189,219	,,	,,	7	7	Do. 'B' 7 p.c.	140—150	...	...
NEWCASTLE EXCHANGE.								
122,877	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	148—150*	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Cn. & New	122—124	...	...
2,061,315	,,	Feb. 3	5	5⅓	Newcastle & Gateshead Con.	24 9—25 3d	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106½—107½	...	...
776,706	,,	Dec. 16	3½	3½	Do. 3½ p.c. Deb. ...	100½—101½	...	...
277,285	,,	Oct. 21	5	5	Do. 5 p.c. Deb. '43...	105—106	...	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	170—172*	...	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	175—185	...	...
55,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	150—160	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	June 7	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	144—147	+2	...
95,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100½—102½	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	...	...	...	Do. 5 p.c. Pref.	117—122	...	...
90,000	1	Nov. 4	5	5	Assd. Gas and Water Ord....	21/—23/-	...	...
90,000	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	22/—23/-	...	...
17,000	Stk	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	162—172	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	162—172	...	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	140—145	...	...
37,440	,,	Feb. 3	10	10	Cam.Univ. & Town 10 p.c.max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	160—165	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	133—138	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	...
130,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
250,000	1	Nov. 18	...	4	Gas Consolidation Ord. ...	20 6—22 6	...	...
250,000	1	,,	...	4	Do. 4 p.c. Red. Cum. Pref.	19 6—20 6	...	+
117,251	Stk.	Sept. 23	8 1/9	8 1/9	Gosport District Cons. ...	177—182	...	...
73,350	,,	,,	5	5	Do. 5 p.c. Pref.	113—118	...	...
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	Dec. 2	5½	5½	Do. 5½ p.c. Deb.... ...	123—128	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	172—177	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	167—177	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	...
107,960	10	Sept. 23	5	4	Mid Kent Ord.	9½—10½	...	9½
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	205—215	−10	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	108—113	−10	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	113—118	...	...
126,193	,,	Nov. 18	7½	7½	Peterborough Ord.	160—170	...	...
64,990	,,	Sept. 9	7½	6½	Redditch Ord.	116—121	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	167—172	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Sept. 23	5	5	Do. 5 p.c. Deb.	122—127	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170*	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152*	...	...
221,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	Nov. 4	5½	5½	S. Midland Gas Cpn.Ltd. Ord.	20/—22/-	...	...
28,866	1	Sept. 9	4½	4½	Do. 4½ p.c. Red. Cum Pref.	20/—22/-	...	...
137,730	Stk.	Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	148—153*	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120*	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116*	...	...
60,425	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
50,000	1	...	...	...	Utd. Kingdom Gas Cpn. Ord.	1⅞—1⅞	...	20/9—21/6
760,910	1	Nov. 18	...	2½	Do. 4½ p.c. Prefd. Ord....	20 3—21/3	...	...
110,910	1	,,	...	2½	Do. 4½ p.c. Cum. Pref. ...	21 3—22 3	...	21/10½
900,000	Stk.	,,	...	...	Do. 3½ p.c. Red. Deb. ...	98—101	...	99½—100½
130,000	,,	Feb. 3	5	8	Wakefield Ord.	137—142	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	101—106	...	...
82,000	,,	Feb. 3	6	6	Weymouth Ord.	106—111	...	...
370,000	,,	Feb. 3	4	6	York Cons.	107—112	...	...
90,000	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	Feb. 3	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	118—123	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
35,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

"Modern Gas Fitting"

PART VI.

of

Gas Fitting Pamphlets

Another of the Popular Series of reprints, in booklet form, of the articles on "Modern Gas Fitting," contributed monthly to the

"GAS SALESMAN"

by

R. N. LeFevre, M.Inst.Gas E.

Officer-in-Charge of Training, The Gas Light and Coke Company, Assistant Head of Department of Gas Engineering and Supply, Westminster Technical Institute.

POST FREE PRICES:

Single Copies, 6d.; 5/6 a dozen. Quantities of 100 for 35/-, plus carriage

WALTER KING, LTD.,

11, Bolt Court, Fleet Street, London, E.C. 4

Parts I to V have been reprinted, and can also be supplied.